

**FOREN 2016 DECLARATION**  
**Conclusions & Recommendations**

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# FOREN 2016 DECLARATION

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## Conclusions & Recommendations



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THE ROMANIAN NATIONAL COMMITTEE OF THE WORLD ENERGY COUNCIL  
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## Table of contents

<b>Foreword</b> .....	7
<b>Summary of the important events</b> .....	15
<b>Session organised under FOREN 2016</b> .....	19
<i>KA1 Session: European policies fostering sustainable energy development</i> .....	19
<i>RTF1 Session: Smart solution for power supply of smart cities.</i>	
Main objective: the energy consumer .....	21
<i>WF1 Session: Human resources for the energy systems</i> .....	22
<i>Regional energy day: Central and Eastern European Energy</i>	
Union for regional integration and security of power supply .....	23
<i>RTF2 Session: Fuel mix options in the region, based on cost analysis for</i>	
the entire life-cycle .....	24
<i>WF2 Session: Energy efficiency, energy conservation. Turning the</i>	
potential into reality .....	25
Energy Trilemma and Energy Security Session .....	27
<i>RTF3 Session: Developments in energy transportation (crude oil</i>	
an natural gas). Collaboration at regional level.....	28
<i>WF3 Session: Energy research. Funding for the sustainable</i>	
development of the energy sector.....	29
<i>KA2 Session: Competition and trading rules in the EU internal market.</i>	
Impact of volatile energy prices .....	30
<i>RTF4 Session: Management, control and monitoring of electricity</i>	
quality. Issues on equipment and related services.....	31

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<b>Scientific communication session</b> .....	33
<i>DS1</i> : National policies and targets for the integration into the EU energy and environmental policies.....	33
<i>DS2</i> : Energy markets. Market operation versus planning .....	34
<i>DS3</i> : Energy efficiency, energy conservation, new trends and issues.....	36
<i>DS4A</i> : Oil, natural gas – conventional and unconventional .....	37
<i>DS4B</i> : Nuclear energy .....	39
<i>DS5</i> : Coal and clean coal technologies .....	40
<b>Corporate-level round table events</b> .....	42
<b>Expoforen 2016</b> .....	43
Messages, conclusions and recommendations presented to the FOREN 2016 participants by the main decision-makers and operators.....	43
<b>General conclusions and recommendations</b> .....	48
<b>Acknowledgements</b> .....	50
<b>FOREN 2016 Sponsors</b> .....	51

# FOREWORD

## FOREN 2016 in a nutshell

**The Central and Eastern Europe Regional Energy Forum – FOREN 2016, focusing on “Safe and Sustainable Energy for the Region” was organised, according to tradition, by the Romanian National Committee of the World Energy Council (RNC-WEC), under the auspices of the World Energy Council – London Office.**

**The event took place between 12 and 16 June 2016, at Vox Maris Grand Resort in Costinești – Romania.**

FOREN 2016 is the 13<sup>th</sup> edition of FOREN Forums that RNC-WEC has been organising biennially since 1992.

The topics debated by the members of the Energy Community - more than 750, of whom 30 were foreign key scientific figures -, focused on the meeting of energy needs based on oil, gas, coal, nuclear and renewable resources, while limiting the carbon footprint, so as to ensure the sustainable development of the energy sector but also of the economy as a whole.

The fact that FOREN 2016 was attended by the Minister of Energy, by State Secretaries in the Ministry of Energy and Ministry of Education, by managers of the main institutions with competence in the field of energy, by specialists in the university and industrial environment, by ASTR (*Romanian Academy for Technical Sciences*) experts and by World Energy Council representatives imprinted the debates held in plenary and in specific sessions with a profound sense of accountability in regard to the future of the energy sector, as a sector of outstanding importance for the country's economic development.

## A wide range of events

The debates organised during FOREN 2016 were structured under **eleven Forum-level Important Events, five Scientific Sessions** and **16 Corporate-level Round Tables**. The topics which were subject to analysis focussed mainly on problems such as access to modern energy, availability of energy and impact of the energy sector onto the environment. It was emphasised that Romania has a privileged position in the region given its varied energy mix, which, if rationally used, will enable a safe and sustainable energy supply to Romania on the medium-term (until 2035). The smart use of renewable energy resources, of nuclear power plants, of solutions targeted towards a limited pollution by the power stations and also the development of smart methods for the burning of fossil fuels are elements that may enable Romania to fully comply with the EU requirements on the limitation of the carbon footprint to values below 450 ppm.

A specific attention was also given to the group of specialists from the Republic of Moldova who, along with the Romanian specialists, debated issues related to the interconnection of the Moldovan energy system with the Romanian one and to the steps required to ensure the interconnection with the European energy system.

FOREN 2016 brought an important contribution in regard to the knowledge of the current technical and scientific status of companies operating in the energy field, as 27 domestic and foreign companies attended this forum and displayed their exhibits and products.

Each event of the Forum was concluded with a package of conclusions, recommendations and measures to be submitted to the competent bodies, with the aim to underline the problems that the energy sector is currently facing and to contribute to the preparation of Romania's Energy Strategy – of which drafting is close to completion.

The sessions on specific topics, which were organised and facilitated by RNC-WEC, dealt with the most important issues currently on the table of the energy specialists' community, namely:

- European policies fostering sustainable energy development (**KAI Session**);
- Smart solutions for power supply of smart cities. Main objective: the Energy Consumer (**RTF1 session**);
- Human resources for the energy systems (**WF1 Session**);



- Central and Eastern European Energy Union for regional integration and security of power supply (**Regional Energy Day**);
- Fuel mix options in the region, based on cost analysis for the entire life-cycle (**RTF2 Session**);
- Energy efficiency, energy conservation. Turning the potential into reality (**WF2 Session**);
- Energy trilemma and energy security (**Energy Trilemma Session**);
- Developments in energy transportation (crude oil and natural gas). Collaboration at regional level (**RTF3 Session**);
- Energy research. Funding for the sustainable development of the energy sector (**WF3 Session**);
- Competition and trading rules in the EU internal market. Impact of volatile energy prices (**KA2 Session**);
- Management, control and monitoring of electricity quality. Issues on equipment and related services (**RTF4 Session**).

The **Scientific Sessions** organised during **FOREN 2016 – DS** accommodated decisive contributions, by the participants, to the settlement of certain important problems related to the energy systems and development thereof:

- National policies and targets for the integration into the EU Energy and Environment Policies (**DS1**, organised with the assistance provided by ISPE – *Institute for Studies and Power Engineering*);
- Energy markets. Market operation versus planning. Role of transmission and distribution system operators on the energy market. Stability-price ratio (**DS2**, organised with the assistance provided by CEZ Romania);
- Energy efficiency. Energy conservation. New problems and trends (**DS3**, organised with the assistance provided by ICPE – *The Electrotechnical Research Institute*);
- Oil, natural gas – conventional and unconventional (**DS 4A**, organised with the assistance provided by ROMGAZ);
- Nuclear energy (**DS 4B**, organised with the assistance provided by RATEN).

The topics debated during the **Corporate-level Round Tables**, which were organised by renowned entities operating in the energy sector, focussed on the main challenges faced by these entities in their endeavour to ensure the sustainable development of the energy sector.

A specific interest was attached both to the Round Table organised by the members of the **VLER Programme within RNC-WEC**, which included debates on the vision and contribution of young people to the building of the energy sector's future and to the **Round Table organised by the Technical University of the Republic of Moldova**, which comprised detailed debates on the problems related to the interconnection between the energy system of the Republic of Moldova and Romania's energy system.

## **FOREN 2016 in Data and Figures**

- **Time interval: between 12 and 16 June 2016**
- **Venue:** Vox Maris Grand Resort in Costinești, the Black Sea
- **Participants:** 743, of which 37 foreign participants
- **Official Opening of the Forum**
  - **Date:** 12 June 2016, 15:00 hours
- **Speakers:**
  - Minister of Energy, Mr. *Victor Grigorescu*.
  - Representative of the General Secretariat to the World Energy Council, Mr. *Einari Kisel*.
  - Head Advisor of the European Commissioner for Energy, Mr. *Jiry Ylkanen*.
  - Vice-President of the Romanian Academy, Mr. *Cristian Hera*.
  - General Director of ELECTRICA S.A., Mrs. *Iuliana Andronache*.
  - President of the Bilateral Chamber of Commerce and Industry Romania-Kazakhstan, Mr. *Petre Lificiu*.
  - President of ANRE (*Regulatory Authority for Energy*), Mr. *Niculae Havrileț*.
  - General Director of ANRM (*National Agency for Mineral Resources*), Mr. *Sorin Gal*.
  - President of ENGIE, Mr. *Eric Stab*.
- **Important Forum Events (11)**

The events were attended by specialists of the Romanian Academy, ASTR (Romanian Academy of Technical Sciences), AOSR (Academy of Romanian Scientists), AGIR (The General Association of the Engineers in Romania), by the collective and individual members of RNC-WEC and by foreign specialists.

- **Guest speakers: 106**, as follows:
  - For KA1, RED, Energy Trilemma and KA2 – a panel of 40 speakers.
  - For RTF1, RTF2, RTF3 and RTF4 – a panel of 34 speakers.
  - For WF1, WF2 and WF3 – a panel of 32 speakers.
- The events were facilitated by the RNC-WEC advisors
- Each event was built around an interactive structure, namely:  
Facilitator → Invited Speakers → Audience
- Each event was concluded with the most important conclusions, recommendations and measures, as arisen from the speakers' presentations and from the held discussions
- **Technical Communication Sessions (5)**
  - Each session was broken-down into 5 time grids.
  - The panels of the 5 communication sessions comprised 75 specialists.
  - 161 papers were presented.
  - 26 prizes were awarded to authors of papers, of which 6 to young specialists
- **EXPO FOREN 2016**
  - 36 exhibition stands, organised by 27 Romanian and foreign companies
  - All exhibition stands organised by high-profile firms and companies, as well as the stand organised by the members of the VLER Programme under RNC-WEC were visited during the EXPO FOREN 2016 Opening Session
- **Corporate-level Round Tables**
  - The Romanian and foreign companies organised 10 Round Tables, where 52 specialists took the floor.
- **FOREN 2016 sponsors**
  - 8 sponsors for the 11 Important Events.
  - 4 sponsors for the 5 Communication Sessions.
  - 14 sponsors for the 31 social-cultural activities.
  - 3 sponsors for the VLER workshop.
- **Mass Media**
  - 8 media partners.
  - 18 media representatives of TV stations, radio stations, newspapers etc.

- **Socio-cultural activities**

- Coffee break during the time interval between 12 and 16 June.
- Dinner offered to sponsors and foreign guests, for 41 persons.
- Welcome cocktail for 300 participants.
- Dinner party for 350 participants.

- **Musical performance**

- On Sunday, June 12<sup>th</sup> 2016, after the Official Opening of the Forum
- Symphonic folklore by Mundicolor orchestra and soprano Ana Cebotaru, with Daniel Jinga as conductor

- **Republic of Moldova**

- 13 participants representing the following entities: UTM (*Technical University of the Republic of Moldova*), State University, Academy of Sciences of the Republic of Moldova, Energy Institute of the Academy of Sciences of the Republic of Moldova, ANRE (*Regulatory Authority for Energy*), Association of Energy Consumers, Agency for Energy Efficiency, IS CMAC Bălți (*State Administration for Applied Meteorology and Certification*).
- Organisation of a Round Table on the topic “Interconnection of energy systems between the Republic of Moldova and Romania”.
- Organisation of a dinner dedicated to the participation of Moldovan specialists in the Forum debates, on 14<sup>th</sup> June 2016 .

- **VLER Programme** (*“Future Leading Energy Specialists in Romania” Programme*)

- Organisation of a Round Table named: “Ener Generation for Tomorrow’s Challenges”.
- Participants: 62, of whom 8 were speakers.
- Organisation of an exhibition stand at Expo FOREN, with the theme: “Energy - today and tomorrow”.
- 8 participants in the Secretariat Forum.

- **Forum Closing Session**

- Date: June 16<sup>th</sup>, 2016 at 16:00 hours.
- Romania conference room.
- Presentation of reports, by the representatives of the five Communication Sessions.
- 26 diplomas awarded to paper authors, of whom 6 young specialists.
- VLER statement.

The **main themes** conveyed to the FOREN 2016 participants were:

- Supply of energy required for a sustainable development of economy.
- Increasing used energy decoupled from carbon emissions accompanying the process in order to meet the EU targets on decarbonisation of industrial processes.
- Development of renewable energy resources and ensuring the conditions for an effective use of such resources in the energy mix, with the aim of achieving the targets on reduced environmental pollution.
- Increasing energy efficiency given that Romania presents a significant energy saving potential which should be capitalised based on the efforts made by the energy specialists.
- Integrating the Romanian energy system into the European system, in order to increase reliability and security of power supply to consumers.
- Training of energy specialists and researchers, with focus on studies concerning topics such as new energy sources, new energy storage systems, smart use of energy, creation of conditions for energy security and accessibility.
- A special attention directed towards accessibility to modern energy for all Romanian inhabitants and to inhabitants of the Central and Eastern European Region, especially in regard to the population in rural areas.



# SUMMARY OF THE IMPORTANT EVENTS

## FOREN 2016 Opening Session

The Opening Session of the FOREN 2016 debates took place on June 12<sup>th</sup> 2016, in the “România” conference room of the Vox Maris Complex. The participants, more than 400, were representatives of the Romanian Government, WEC executive officials, members of the academic environment, industry specialists and researchers, who listened with great interest to the welcoming addresses delivered by Mr. **Iulian Iancu** – President of RNC-WEC, Mr. **Victor Grigorescu** – Minister of Energy, Mrs. **Elena Nekhaev** – Director of Technical Programmes within the World Energy Council, Mr. **Cristian Hera** – Academician and Vice-President of the Romanian Academy, Mr. **Mihkel Harm** – General Secretary of WEC Estonia, Mrs. **Iuliana Andronache** – General Director of Electrica SA, Mr. **Niculae Havrileț** – President of the Regulatory Authority for Energy (ANRE), **Mr. Eric Stab** – President & CEO of ENGIE Romania, Mr. **Sorin Gal** – President of the National Agency for Mineral Resources (ANRM), Mr. **Petru Lificiu** – President of the Chamber of Commerce and Industry Romania-Kazakhstan, **Mr. Octavian Lohan** – member of the Management Board of Transelectrica, Mrs. **Iuliana Andronache** – General Director of Electrica SA, Mr. **Corneliu Bodea** – CEO of ADREM.

During the second part of the FOREN 2016 Opening Session, the participants enjoyed a Romanian musical performance by an orchestra conducted by *Daniel Jinga*, with *Ana Cebotari* from the Republic of Moldova as vocal, who charmed the audience with wonderful melodies of the local musical repertoire.

## **Key messages conveyed to participants**

- *FOREN 2016 is an event of outstanding importance for the current state of business, when the energy sector is undergoing profound changes mainly due to issues linked to energy accessibility and availability, but also to issues related to the limitation of the carbon footprint that the energy systems generate onto the environment.*

*During the two years that passed since the previous FOREN event, significant changes occurred in regard to the general concept around the development of the energy sector and certain myths underlying prior estimations were dismantled:*

- *The energy peak consumption envisaged for 2016 was not realistic: the oil barrel price showed important fluctuations and the conception that the renewable resources will play an increasingly important role in meeting the energy demand became more prominent.*

- *The depletion of natural gas reserves is no longer a topical issue; with the appearance of shale gas, the gas demand is covered for the next 250 years;*

- *The disappearance of nuclear plants is no longer a priority; more than 150 nuclear plants are in operation today and the emergence of nuclear fusion power plants is expected.*

*The energy specialists are determined to commit to the new challenges and to courageously face the challenges to be overcome in the years to come (**Iulian Iancu**, President of RNC-WEC).*

- *Romania's energy system is one of the most important in Europe, but it needs to be reinvigorated, improved and transformed. Romania is a major contributor and an important energy security factor in the region. The development of the gas market also implies the completion of the connection with Bulgaria. The company Hidroelectrica has gone through a very difficult journey, but it has now entered the group of large companies and displays a clear development path, with opportunities to upgrade the hydro-electrical plants and to open up towards the international energy services market. The development of the Romanian energy sector in general and of the nuclear sector in particular requires that a specific attention be given to the research & development sector, which shall provide the foundation for a reliable energy strategy of the future. Nowadays, Romania operates in a globalised market, and this requires strong partnerships with all system operators.*

*The efforts made by the energy specialists shall focus on the creation of a powerful sector and on the achievement of the objective whereby Romania becomes an important energy security pillar in Europe (**Victor Grigorescu**, Minister of Economy in Romania).*



• *I would like to take this opportunity to send a warm message of success, on behalf of the World Energy Council and on my own behalf, in regard to the debates organised by RNC-WEC during FOREN 2016. Given the current energy status, specialists play a key role in ensuring the fulfilment of WEC targets on accessibility, availability and sustainability of energy, with minimal effects onto the environment. For this purpose, it is required that all existing forms of energy resources be considered and used in a manner that will minimise the carbon footprint* (**Elena Neckhaev**, Director of Programmes within the World Energy Council).

• *Energy is the key to development. The focus is on the need to confine the disturbances that the technological development and the irrational use of resources exert onto the “human-nature” system – a reasoning of the type “Full planet, empty plates” cannot be applied –* (**Cristian Hera**, Vice-President of the Romanian Academy).

• *We congratulate the Romanian National Committee of the World Energy Council on the organisation of this event of great importance for the Central and Eastern European Region. I am expressing my strong belief that the Forum participants will engage in a fruitful exchange of experience enabling the analysis and settlement of complex problems pertaining to the current energy system, for the purpose of fulfilling the targets proposed by WEC on energy affordability, availability and supply security. It goes without saying that the environmental-related issues shall become a major concern for each energy specialist* (**Mihkel Harm**, General Secretary of WEC Slovenia).

• *The entire community of energy specialists has great expectations from this important event. The generous themes which are subject to debate during this Forum create a great opportunity for experience exchange and for the transfer of good practices towards all activity sectors, from production to consumption. It is expected that a set of recommendations be prepared, based on the conclusions extracted following the conferences held during FOREN 2016* (**Iuliana Andronache**, General Director of Electrica SA).

• *The Regulatory Authority for Energy (ANRE) made significant efforts to ensure the liberalisation of the energy sector and to provide the conditions required for a safe supply to consumers. Efforts are also made to ensure the predictability and stability of market prices, as well as to secure the transparency required by the investors in the free market – of which share is constantly increasing* (**Niculae Havrileț**, President of ANRE).

• *It is with great appreciation that we consider the concerns of Engie Romania for limiting the environmental pollution by promoting renewable energy and low carbon footprint resources. These issues were presented by Eric Stab, who underlined that the energy operators should focus on the consumer – and this is also one of the major objectives pursued by the multinational company he represents (**Eric Stab**, CEO of Engie Romania).*

• *I wish every success to FOREN 2016 and I express my firm belief that the technical sessions will comprise in-depth examinations of the problems related to energy resources in Romania and the rational use thereof, for the purpose of meeting the energy needs and enabling the sustainable development of Romania (**Sorin Gal**, President of the National Agency for Mineral Resources – ANRM).*

• *All specialists in the field shall adopt the measures required to alleviate the effects of climate change. The efforts made by RNC-WEC in regard to the settlement of problems specific to the current society development phase are highly appreciated. Kazakhstan, as a country he represents within the Chamber of Commerce and Industry, is a nation with important mineral and energy resources, it is “the country where all the elements of Mendeleev’s period table can be found” – as he stated in its intervention. The country is in great need of specialists to be able to capitalise all its reaches and to adopt the most effective measure for limiting the environmental pollution (**Petru Lificiu**, Honorary Consul of Kazakhstan in Romania).*

• *Transelectrica, the Romanian Transport and System Operator, is well inter-connected with the European system providing the electricity transfer to the European market. Although a significant number of upgrading operations took place, new operations are under preparation for the development and upgrading of the system so as to set the basis for an optimum operation of the electro-energetic system. Efforts are made to achieve the EU target on the level of interconnection with the neighbouring countries and discussions are on-going on the interconnection with the Republic of Moldova (**Octavian Lohan**, member of Transelectrica’s Management Board).*

• *Our full attention shall be focused on the current world energy problems and on the specific issues demanded by the European Union. We urge all organisations operating in the field to speak with one voice, a stronger voice, so as to enable Romania become an important member of the World Energy Community and assert itself as a stability factor in Europe (**Corneliu Bodea**, CEO of Adrem Invest).*

# SESSIONS ORGANISED UNDER FOREN 2016

## ***KA1 Session***

### **European policies fostering sustainable energy development**

The event, facilitated by Mr. **Victor Muşatescu** – Ph.D. Prof. Eng. and Scientific Advisor to RNC-WEC and by Mr. **Slav Slavov** – former WEC coordinator for Europe, aimed to foster the understanding of European policies on the sustainable development of the energy sector at the level of the region and particularly at the level of Romania. As the EU framework strategy, based on the creation of the European Energy Union, promises a series of medium and long-term advantages – horizon 2035 and vision for 2050, the event organisers prepared a proactive session based on pertinent questions such as: **1)** Is EU capable of providing energy that is safe, ecological and affordable for Europe? **2)** Is the smart use of energy, combined with climate change alleviation efforts, the momentum required to create employment, generate economic growth and genuine investment for the European future? **3)** Is a fully integrated energy market a guarantee for a safe supply of energy, at affordable prices? **4)** Are the investments in the creation of an infrastructure interconnecting several countries capable of streamlining the energy circuit, reducing import dependency and preparing the networks for energy from renewable resources? **5)** Is the role of energy efficiency overrated and what is the future of smart solutions? **6)** Are the final consumers considered in a sufficient manner? What about the vulnerable consumers, in an economy where energy is costly? **7)** Is “Horizon 2035” clear for the Romanian energy sector?

## **Conclusions and Recommendations**

1. The European energy sector is undergoing a profound and swift change in terms of sustainability requirements: the increased share of renewable resources in the fuel mix of the continent and of the Central and South-Eastern European region, an accelerated decarbonisation and technological changes process, while the electricity and gas markets shall be adjusted accordingly.
2. The consumer of energy services will play a more active role, will be the focus of producers' and suppliers' concerns, will have access to smart networks and will benefit of products enabling a superior energy use.
3. The development of the integrated domestic energy market will depend upon the new projects for interconnection of the countries in the region, which justifies the importance of support provided for the Projects of Common Interest.
4. Energy price is still a matter of concern, especially in the context of an increased share of renewable resources, but yet there is also good news in regard to the favourable dynamics of investments costs for such resources – as these costs are recording a visible descending trend.
5. As regards the transportation and distribution networks, there are still concerns due to the accentuated penetration of meteorological resources, a situation which calls for additional measures to increase the resilience and adequacy of such networks.
6. Consideration shall be given to the problem of commercial consumers that are forced to relocate their companies to other geographical areas due to reasons which also include the high costs of their energy invoices, but also to the household consumers of whose vulnerability is on an ascending trend even in countries with a high economic power.
7. Although the future is outlined at continental level, the specific elements which are different from country to country will imprint their indigenous features. To be mentioned nevertheless that the national-level approach shall fit within the global-level approach and shall enable a smooth adjustment of the sector during this transition process. For Romania, the new sector strategy will certainly become a milestone, but we must however expect rapid changes, as we live in a world that is under a permanent transition.

## **RTF1 Session**

### **Smart solutions for power supply of smart cities.**

#### **Main objective: the energy consumer**

With Mr. **Călit Vilt** – Engineer and Scientific Advisor to RNC-WEC as moderator, the RTF session emphasised the latest developments and concerns at the level of the European Union as a result of the negotiation and adoption, on May 30<sup>th</sup> 2016, of the *Pact of Amsterdam* with its *New Urban Agenda of the Union*. The new urban agenda set forth, at the level of Development Ministers, a number of actions structured under 12 chapters, among which: digital and energy transition, urban mobility, adaptation to climate change, circular economy as well as other fields of activities. With the adoption of this document, EU Member States are given a coherent framework of very clear rules, standards and financing mechanisms enabling the implementation of the concept in the Member States.

The event also included a tutorial presented by Mr. **Mircea Eremia** – Ph.D. Prof. Eng., with the theme “*Effective electro-energetic systems based on power electronics, from Smart Grids & Supergrid to smart cities*”.

### **Conclusions and Recommendations**

1. The issues related to smart buildings/cities represented a very good basis for substantiating the implementation of the Pact of Amsterdam with its new Urban Agenda;
2. In regard to the change of lighting systems, from the traditional ones to LED technology systems, it was estimated that approximately 80% of the lighting systems will be LED – based until 2020, and such systems will lead to a reduction of energy requirements by approximately 50% until 2030.
3. The shift from incandescent or fluorescent lighting (resistive) systems to LED systems (which are non-linear systems) is already causing disturbances – such as modifications in the electrical load, changes of harmonics in the neutral conductor and other effects.
4. For the network operators to be able to cope with the new challenges, it is obvious that programmes are needed to monitor the behaviour of the network parameters over time, to perform measurements and to conduct thorough research and analyses on the behaviour of active elements of the electrical networks.

5. For the purpose of preventing major incidents due to cyber security deficiencies, the Cyber Security services provided by Honeywell perform on-going analyses on all potential internal and external risks of cyber-attacks onto the computerised systems, as prevention is their core activity.
6. The implementation of the high level digital technology with new architectures for the metering networks. The “Info Clients” Platform of ENEL represents a new dialogue tool between the utilities company and the clients and contributes to the improvement of electricity distribution and supply services.
7. The development and promotion of the smart cities and networks concept in Romania follows the fast pace applicable at the level of the European Union due to the recent adoption of the Pact of Amsterdam with its new Urban Agenda.

### **WF1 Session**

#### **Human resources for the energy systems**

Facilitated by the teaching staff of the Polytechnic University of Bucharest, session WF1 approached problems of outstanding importance for the training of new generations of specialists to cope with the energy systems of the 21<sup>st</sup> century.

Themes of special interest were subject to debate by participants in regard to the orientation of the education system according to the development needs of the current energy systems, among which:

- Status quo of the workforce in the Romanian energy system;
- Impact of technological developments onto the training and provision of the workforce;
- Middle and high-level education system for oil and gas industry professionals;
- Lifelong learning for specialists; role of beneficiary units;
- Provision of funds to universities for endowment of laboratories;
- Post-graduate education – collaboration between universities and industry.

## **Conclusions and Recommendations**

1. It is absolutely mandatory that all energy-related Faculties within the higher education institutes should ensure the training of high-level specialists.
2. A company's success depends on the allocation of the right people to the right positions and this requires that the selection and monitoring of staff performance be carried-out by means of a correct and transparent management.
3. The current higher education systems in the field of energy, oil and gas shall corroborate their education curriculum with the latest science and technological developments and shall consider the global nature of the energy industry, while the specialists shall provide their services on an international market, where mobility is a specific feature of the current status of the world economy.

## **Regional Energy Day: Central and Eastern European Energy Union for regional integration and security of power supply**

Under the moderating role of Mr. **Anton Vlădescu** – Engineer and Scientific Advisor to RNC-WEC, the event examined the latest trends in the regional, European and world energy sectors.

The main themes subject to debates included:

- National and regional policies aimed at covering the energy demand;
- National and regional policies on the development of energy transportation infrastructures and interconnection thereof;
- Development of national and regional energy structures for the purpose of ensuring the security of power supply;
- Policies on the diversification of energy resources;
- National and regional policies on nuclear, coal, gas, renewables energy;
- Policies on environmental protection;
- 2016 Energy Issue Monitor – a Climate of Innovation responding to the Commodity Price Storm;
- The European South-South East Region.

## **Conclusions and Recommendations**

1. The EU energy policy has as main target the creation of the European Energy Union which, at the outset, envisages the setting-up of regional unions to be subsequently merged;
2. In the light of the new geopolitical challenges and of the targets set forth by EU and COOP 21, the fulfilment of the above target requires a new “market design”;
3. This new design of the European energy market shall be based on innovation and research, while the main directions shall concern the market design and technologies (energy storage and transportation);
4. The energy policy decisions shall be substantiated by in-depth modelling and impact studies;

### ***RTF2 Session***

#### **Fuel mix options in the region, based on cost analysis for the entire life-cycle**

The debates organised under the RTF2 session held on **June 14<sup>th</sup> 2016** were facilitated by Mr. **Alexandru Pătruți** – Ph.D. Eng. and Scientific Advisor to RNC-WEC and emphasised the importance and the highly topical nature of the theme subject to discussions as well as the need that Romania and the entire region should use at this point in time all forms of energy available to them, with the aim to enhance the security of power supply.

## **Conclusions and Recommendations**

1. In order to achieve a balanced energy mix, capable to meet the standards assumed for the purpose of ensuring the security of power supply, to fulfil the environmental targets and to reduce the import dependency level, measures are needed at this point in time to develop the local capacities and to use all forms of primary energy resources which are available;
2. By means of an adequate energy strategy and by capitalising the available resources, Romania may play a decisive role in ensuring the energy security in the Central and Eastern European area.



3. The presentation on the actual state of facts and on the perspectives attached to the hydrocarbon exploration works in the Black Sea emphasised the need to develop the natural gas production in this area and to reassess the onshore oil potential, so as to put a stop to the declining local hydrocarbon production and to meet the internal demand of natural gas, while also providing for export.
4. By means of an adequate energy strategy and by capitalising the available resources, Romania may play a decisive role in ensuring the energy security in the Central and Eastern European area.

### **WF2 Session**

#### **Energy efficiency, energy conservation. Turning the potential into reality**

Session WF2, which was moderated by Mr. **Emil Calotă** – Vice-President of the Regulatory Authority for Energy (ANRE) and by Mr. **Vasile Rugină** – Scientific Director of INCDE ICEMENERG and Advisor to RNC-WEC, pointed out that an increased energy efficiency is one of the three national priorities in the field of energy, as set forth in the context of the *Europa 2020* national targets that Romania committed to under the *National Reform Programme (NRP) 2016*, while the Regulatory Authority for Energy (ANRE) and RNC-WEC promote a constructive dialogue with all stakeholders involved in the regulatory activity as well a permanent dissemination of information on the national and European-level legal developments in the field of energy efficiency.

According to the principles underlying the European Energy Union, as set forth in the European Commission Communication COM/2015/080, the measures enabling an increased efficiency of used energy, when disseminated in a sustained manner among the energy consumers, are essential elements for decreasing the costs of energy invoices and therefore the measures targeting an increased energy efficiency will be at the basis of all future decisions made within the European Energy Union.

## Conclusions and Recommendations

1. Romania has made important progress over the past years with regard to increasing the energy efficiency. The primary energy intensity is on a permanent descending trend, as shown by the value of this indicator in 2014 – *i.e.* 0.235, calculated in toe/1000 Euro 2010 – which was practically equal to the value recorded in other Central and Eastern European countries (but still above the EU28 average).
2. Law No. 121/2014, once it was approved, set the legal framework required for the preparation and enforcement of the national policy on energy efficiency and led to the reinforcement of the institutional framework and to an increased quality of activities carried-out at all levels and in all fields of activity;
3. The high efficiency cogeneration is deemed as a strategic option, while Romania's achievements in the past years are remarkable, enabling primary energy savings of 14,729 GWh and reduced CO<sub>2</sub> emissions of 3,989 thou. tonnes;
4. Of a remarkable importance is the enhanced energy efficiency at the level of municipalities, as a result of actions undertaken by the local authorities;
5. Buildings present a very high potential to reduce the energy needs;
6. The high efficiency cogeneration is a strategic option and it is promoted both by European Directives and by Romania's primary and secondary legislation.
7. The programme „Advice for Small Businesses (ASB)”, initiated and currently implemented in Romania by the EBRD, provides non-reimbursable financing of up to 75% of the net costs of consultancy projects;
8. The implementation of energy efficiency and renewable resources policies shall be supported by awareness-raising activities;
9. Young generations shall be involved and educated in the spirit of efficient use of energy resources. The optimum method to change a person's behaviour in relation to the use of energy resources is to start by changing our own behaviour.

## **Energy Trilemma and Energy Security Session**

The goal pursued by the „Energy Trilemma” session, that was facilitated by Mr. Gheorghe Indre – Ph.D. Eng. and Scientific Advisor to RNC-WEC, was to disseminate the content of the 2015 Energy Trilemma Report prepared by WEC based on a contract signed with the consultancy firm *Oliver Weyman*. The data included in the report was used as a basis to analyse those specific issues related to Romania’s energy policy which could contribute to the balancing of values corresponding to the three energy indicators included in the energy trilemma, namely: the energy security indicator; the indicator on energy equity and access to energy for all categories of users; and the indicator on the sustainable development of the energy sector.

The main themes debated during the Energy Trilemma session were mainly focused around the following topics:

- Structure of energy production in Romania, role of coal-based production and methods used to approach these issues in the energy strategy;
- Role played by the state and its specialised institutions in the settlement of problems which were subject to debates on issues related to energy strategy, vulnerable consumers;
- Research and development activities and their importance for the energy sector and for the activities carried-out by utilities companies, involvement of specialists and of academic and education institutions in Romania in research and development activities.

### **Conclusions and Recommendations**

1. The usefulness and value of the Energy Trilemma Report for the design of Romania’s energy strategy and policy was emphasised;
2. A series of observations were formulated on Romania’s standing as compared to Poland, mainly in regard to the sustainability indicator and it was recommended that internal concerns be strengthened as regards the quality and accuracy of data used for calculating the value of indicators;
3. It was recommended that RNC-WEC upholds its interest as regards its involvement in the preparation of future WEC reports and in the dissemination of reports’ results among the Romanian community of energy specialists.

**RTF3 Session**  
**Developments in energy transportation**  
**(crude oil and natural gas).**  
**Collaboration at regional level**

The event was facilitated by Mr. **Aristotel Jude** – State Secretary in the Ministry of Energy, by **Andrew Costin** – President of Petroleum Club of Romania and by **Niculae Napoleon Antonescu** – Ph.D. Prof., Honorary Rector of the Oil/Gas University and Scientific Advisor to RNC-WEC. The RTF3 session examined a series of main problems faced by the operation and exploitation components of the national hydrocarbons transportation and distribution systems, which are due to the tens of years that have passed since the systems were made operational. In order to be able to meet the current requirements of the modern transportation and distribution systems and the requirements related to the interconnection with the neighbouring countries, these systems require urgent workover as well as upgrading and expansion works. The debates also included analyses of important problems related to this activity as well as other relevant technical, economic and legal issues in this regard.

The main themes subject to debates during the session were:

- Assessing the current status of the national transportation systems for crude oil and natural gas, including aspects related to the upgrade, computerisation and monitoring of such systems and their impact onto the environment;
- International transportation systems for natural gas and interconnection with neighbouring countries, as well as the possibility of diversifying the gas supply by means of gas pipelines or liquefied gas.
- Distribution of natural gas, status of the current distribution network including the prospects for upgrading and expansion.
- Economic and legal issues regarding the transportation of natural gas and crude oil and the impact exerted by the transportation costs onto the consumer price.

**Conclusions and recommendations**

1. The national transportation and distribution systems for hydrocarbons play a very important role in the supply of energy to the national economy;

2. These systems require essential workover as well as upgrade and expansion work in order to meet the current needs;
3. Conditions shall be provided for the interconnection with the energy systems in the area, in the light of creating the single European market.

### **WF3 Session**

#### **Energy research. Funding for the sustainable development of the energy sector**

With Mr. **Ionuț Purica** – Ph.D. Prof. Eng. as facilitator, the WF3 session analysed major issues related to:

- availability and costs of the new technologies for sustainable development of the energy sector; financing support schemes;
- legal, institutional and regulatory framework required for an incentivising climate underpinning the research & development and dissemination activities (R, D & D);
- financing sources and mechanisms for energy projects;
- national and regional projects on the energy security of the region; risks, benefits and best practices;
- role of international financial institutions and of European funds in the development of investment models and in meeting the requirements for a sustainable development of the energy sector in the region;
- financing of studies on unconventional energy resources;
- collaboration among universities and industry in regard to research & development activities and pilot projects.

#### **Conclusions and recommendations**

1. Scientific research in the field of energy may provide the prerequisites for a safe and affordable energy supply, with a minimal impact onto the environment, enabling the development of the economy for the coming decades.
2. The EU acknowledges the importance attached to the financing of scientific research and adopts specific programmes to provide the funds that the researchers need.

3. The energy sector cannot be developed solely based on the mechanisms of the energy market. State intervention is useful to set the required legal framework and the conditions required for the interconnection with the European energy market.
4. Several effective solutions are currently available to obtain funds for investment projects in the energy sector, but there is a need to substantiate the project sustainability and its minimal impact onto the environment.

### ***KA2 Session***

#### **Competition and trading rules in the EU internal market. Impact of volatile energy prices**

Organised by RNC-WEC together with OPCOM S.A. and facilitated by Mr. Nicolae Golovanov – Ph.D. Prof. Eng. and Scientific Advisor to RNC-WEC, the KA2 Session aimed at debating certain important issues related to the actual status of electricity and natural gas markets and to the development of those markets, so as to lead to the creation of the single European energy market. The main themes which were subject to debates included:

- integration of national electricity and natural gas markets with the regional and single European markets;
- role of energy exchange markets under the new European legal framework;
- integrity and transparency of electricity and natural gas markets;
- electricity and natural gas market – from expectations to achievements;
- Smart Grid / Metering / Microgrid contribution to the development of the electricity market;
- integration of volatile energy resources into the energy markets, pursuant to the competition rules.

The importance of problems which were subject to debates was outlined during the opening of the event, while the important role played by the energy markets in the adequate functioning of an energy system was as well emphasised.

Words of appreciation were directed towards OPCOM in regard to its role in ensuring the adequate functioning of energy markets both in Romania and in the region, its concerns for the development of market mechanisms and its efforts to ensure the prerequisites for the creation of the single European market.

## **Conclusions and recommendations**

1. The electricity and gas market in Romania witnessed a steady development, further to the creation of trading mechanisms which enabled an effective operation of the internal market. At the same time, efforts were made for achieving, interconnecting and coupling the Day Ahead Markets (DAM) with Hungary, Slovakia and the Czech Republic, for the implicit allocation to the Hungarian border and also for the coordinated bilateral allocation with the other borders. Prospects have been also made for a future performant regional balancing market;
2. The further development of the market coupling process requires the physical interconnections with neighboring countries.
3. The experience of the Romanian Market Operator can be most useful in preparing Moldova's power system coupling to the Romanian electricity market.
4. The successful implementation of the Czech-Slovakia-Hungary expansion project to Romania, based on the (EC) nr. 1222 / 2015 Regulation for a minimum harmonized set of rules meant for the Day Ahead and Intra-Day Markets single market coupling, is an important step to achieve the European single market.
5. A particular attention should be paid to the IT structure in order to ensure a high security level of the conveyed information. Modernisation of the bank payment flows based on a joint project of the Romanian Banking Association and Transfond by using a new direct debit scheme has led to important benefits which resulted in a fluid and expeditious collections.

### ***RTF4 Session***

#### **Management, control and monitoring of electricity quality. Issues on equipment and related services**

The RTF 4 Session, which was facilitated by Mrs. **Doina Ilişiu** – Ph.D. Eng. and manager of Transelectrica – UnO DEN, dealt with issues of great significance for the current development phase that the energy system is undergoing, namely:

- requirements on the quality of electricity, as stated in the consumers' connection codes,

- practical elements related to the quality of electricity, as included in the certification process for wind and photovoltaic power plants as well as for electricity storage facilities,
- principles for monitoring the quality of electricity in relation to the renewable energy resources and perturbing consumers; principles and sizing methods for electricity storage units.

### **Conclusions and recommendations**

1. The most stringent concerns for the coming three years refer to the processes linked to the implementation of the new European connection codes;
2. The essential issues of technical and regulatory nature will generate decisive effects during the years to come;
3. The future use of low and large (above 1 MW/h) capacity energy storage units will lead to major changes as regards the settlement of electricity quality issues but also to functional problems of the electrical power system.



# SCIENTIFIC COMMUNICATION SESSIONS

## **DS1: National Policies and Targets for the Integration into the EU Energy and Environmental Policies**

The main themes debated during the scientific communication session focused on:

- Energy and environmental policies;
- Power supply security;
- Accessibility to energy resources and financing mechanisms;
- Renewable energy resources in Romania and world-wide;
- Use of renewable energy resources.

### **Conclusions and recommendations**

1. The session underlined the importance of using renewable energy resources (RER) and, in this context, the importance of rethinking the policies providing support to projects proposing the use of RER, so as to avoid the perturbation of market mechanisms.
2. The specialists were presented with solutions for integrating national energy and environmental policies into the EU policy and with proposals of innovative solutions for integrating the national energy and environmental policies into the EU policy.

Session	Prize	Paper	Authors
DS1	I	Prospects of solid biomass in the rural energy system of the Republic of Moldova	Dumitru Bostan, Valentin Arion
	II	Forecast on the energy demand in Romania for the time interval 2014 – 2035. Comparisons between European Union level reporting and the potential developments of the energy demand	Daniela Burnete, Anca Popescu, Marian Dobrin, Irina Vodă, Anca Bardici
	III	Considerations on the vulnerability of household consumers of energy services	Cătălin Zamfir, Virgil Mușatescu
	Youth section	Flexible generation for conventional thermal power plants: current status and trends	Diana Tutica, George Darie, Victor Cenușă, Florin Alexe, Mihaela Norișor.

### **DS2: Energy markets. Market operation versus planning**

The 29 papers presented during DS2 concerned issues of specific interest in regard to the current energy systems, which present a series of vulnerabilities as a result of technological development and enhanced endowment with modern computerised system; such vulnerabilities shall be considered in order to enable a secure and reliable operation of the energy systems. Another theme which was underlined concerned the fact that Romania plays an important part in the coupling of the energy market to the European market (Hungary, Czech Republic, Slovakia) and can support the Republic of Moldova in its endeavours to increase the security of electrical power supply.

For this purposes, the interconnection between the two electrical power systems – under an asynchronous regime for the first phase – will enable the achievement of this expected development and also the participation of the Republic of Moldova in a market model compliant with the regulations imposed by ENTSO-E;

The themes of interest examined during the DS2 scientific session were as follows:

- Problems faced by the energy markets;
- Integration of renewable resources;
- Risk in the energy systems;
- National Energy System under the European Energy System;
- Performance of the Energy System.

## Conclusions and recommendations

1. The market model shall be improved to allow for the market integration of renewable energy resources while eliminating the current distortions;
2. Given the increased competitiveness and transparency, the creation of the European energy market is a highly topical issue;
3. The experience to be acquired in the immediately following phase, during the asynchronous interconnection, will enable the preparation for the future synchronous operation requested by Ukraine and by the Republic of Moldova.
4. As proven by Romania's and Bulgaria's experience, the completion of the programme in accordance with the ENTSO-E Association Agreement will take approximately 10 years. Romania plays a special part in the coupling of the energy market to the European one (Hungary, Czech Republic, Slovakia) and can support the Republic of Moldova in its endeavours to increase the security of electricity supply. For this purpose, the interconnection between the two electrical power systems – under an asynchronous regime for the first phase – will enable the achievement of this expected development and also the participation of the Republic of Moldova in a market model compliant with the regulations imposed by ENTSO-E;

Session	Prize	Paper	Authors
DS2	I	Capacity Allocation – Current Practice and Expected Development	Daniela Diaconu, Mihaela Stanca Petrescu, Ioana Crăciun, Florina Amza, Octavia Unguroiu
	II	A powerful tool in the protection setting – measurement of OHL electrical parameter	Gheorghe Moraru, Florin Bălăşiu, Dan Soare
	III	Photovoltaic (PV) lighting in urban and rural communities	Ionuț Ciobanu, Radu Pentiu
	Youth section	The importance of the Ancillary Services to Maintain The National Power System Safety, within the Present Situation of Permanent Development of the Renewable Power Plants (Wind and Photovoltaic)	Emanuel Ioniță, Ioana Crăciun
	VLER Honourable prize	Photovoltaic (PV) lighting in urban and rural communities	Ionuț Ciobanu, Radu Pentiu

### **DS3: Energy efficiency, energy conservation, new trends and issues**

The debates under DS3 sessions were highly scientific and were extremely spirited, as the approached themes are extremely topical and raise a lot of challenges.

The 46 papers presented induced analyses on topics such as energy efficiency in regard to buildings and industry, renewable resources, smart cities, electrical mobility and infrastructure, energy storage – as themes of specific interest in the current energy context.

The papers also offered perspectives and solutions for the development of the energy sector in light of the enhanced energy efficiency of the industry and buildings in general, by means of a direct approach of the “smart city” concept, on one hand, and by migrating towards the area of electro-mobility and development of the supporting infrastructure, on the other hand.

#### **Conclusions and recommendations**

1. The session revealed the authors’ concerns in regard to sustainable development, energy efficiency and renewable resources energy;
2. Due to its major contribution to the security of energy supply, to the sustainability and competitiveness, to the saving of primary energy resources and to the reduction of greenhouse gas emissions, an enhanced energy efficiency is a priority within the national energy policy of Romania;
3. The debated themes included topical issues on the development of smart cities, on the development of the electro-mobility sector and on the reduction of the carbon footprint.
4. The papers presented during the session outlined the today’s European energy policy which follows the concept of sustainable development and makes reference to important issues such as: increased energy efficiency, sustainable development of energy production, transportation and use/conversion, energy supply security and reduction of greenhouse gas effects by means of creating smart cities, developing the electro-mobility etc.

Session	Prize	Paper	Authors
<b>DS3</b>	I	Complete solutions to achieve electric propulsion for light vehicles	M.G. Neacșu, V.S. Stanciu, G.V. Rașnoveanu, S.S. Matei, C. Nicolescu
	II	Increasing Energy Efficiency throughout Simulation Based Control for Non-Residential Existing Buildings	Bogdan-Alexandru Onose, Viorel Ursu and Lucian Demeter
	III	OMV Petrom SA, an important operator that generates energy savings due to the use of combined-cycle and cogeneration power plants	Justian Liviu Rențea
	Youth section	Quality of Electricity in the Certification Process for Wind and Photovoltaic Power Plants and for Electricity Storage Facilities	Cristian Tudor, Doina Ilișiu

### **DS4A: Oil, natural gas – conventional and unconventional**

The 26 papers, prepared by highly-reputed specialists who are known and acknowledged in their fields of activity, but also by promising young researchers with real scientific and/or technological research abilities, were grouped into three distinct themes, namely:

- Geology and Reservoir Engineering in the oil and gas industry;
- Economic and safety/risk problems specific to the oil and gas industry;
- Problems related to drilling and extraction technologies, transportation of hydrocarbons and bio-fuels.

#### **Conclusions and recommendations**

1. Hydrocarbons (oil and gas) have an important share in Romania's energy balance, both as a source of primary energy but mostly as a resource for fuel and direct air-conditioning systems for buildings and/or for the industry sector;
2. Hydrocarbons are specifically important for ensuring Romania's energy independence. However, due to the natural decline of deposits exploited for a significant period of time, on one hand, and to the significant decrease of exploration works pursuing the discovery and/or capitalisation of new deposits, on the other hand, the domestic production can only meet a part of the domestic consumption

requirements and therefore large quantities – oil/crude oil in particular – need to be imported in order to meet the domestic consumption;

3. It is imperative that the exploration and exploitation works be urgently expanded to new hydrocarbon deposits – conventional and unconventional, both „onshore” and „offshore”;
4. The decreasing cost, mainly for crude oil, along with the increasing supply of oil and gas on the world market, led to a significant reduction of investments in exploration – exploitation works (upstream), with dramatic consequences both in terms of technological and economic components and in terms of social effects;
5. Notwithstanding all unfavourable geo-political issues, it is commendable that many companies and institutions still invest quite considerably in scientific and technological research in this field. A large number of scientific, technological and technical-engineering papers have been written, which are extremely useful and comparable in level to the papers developed at international level.

Session	Prize	Paper	Authors
<b>DS4A</b>	I	Uncertainties in the assessment of gas resources and reserves: impact and economic risk	Argentina Tătaru, Dan Paul Ștefănescu, Florinel Șuțoiu
	II	Issues on drilling riser tubing for deep and ultra-deep water drilling	Niculae Napoleon Antonescu, Claudiu Tanasa, Lazăr Avram, Marius Stan, Valentin Tudorache
	III 1	Production of alternative solid and liquid fuels using waste thermal conversion	Iustina Stănculescu, Gabriela Ionescu, Adrian Badea, Cosmin Mărculescu
	III 2	Issues regarding the inner inspection of 12”, 14”, 20” and 28” crude oil transportation pipelines by means of the smart Go-devil method applied by CONPET SA, as a basic pipeline integrity management method	Ion Beldiman, Alexandru Cătălin Ionescu
	Youth section	Methods used for getting access to undrained areas in mature natural gas deposits	Nicolae Bogdan Simescu, Ion Foidaș, Sandor Bolazs
	Special prize	Artificial Lift Strategy implementation in OMV Petrom	Liviu Firu

## **DS4B: Nuclear Energy**

The purpose of the DS 4B session was to facilitate an exchange of opinions and information meant to contribute to the implementation of the energy sector strategy, while the overall target was to meet the present, medium and long-term energy needs through the use of technologies that are effective both in terms of costs and in terms of energy safety and security, in compliance with the sustainable development principles.

The session debates focused on the contribution of nuclear energy to the efforts directed towards the meeting of energy demand, while limiting the environmental pollution.

The debates also benefited from the collaboration with foreign institutions such as ENEA and ANSALDO of Italy.

### **Conclusions and recommendations**

1. Romania is endowed both with the required infrastructure and with the technical and human potential needed for the execution of a complete nuclear cycle;
2. Nuclear energy in Romania is assisted by a scientific, technical, research & development and technological engineering support with a tradition of more than 45 years;
3. Romanian specialists have the required capabilities to contribute to the development of the new GIV reactor concepts by implementing the Lead-Cooled Fast Reactor Demonstrator – ALFRED, in compliance with the medium and long-term European strategy.

<b>Session</b>	<b>Prize</b>	<b>Paper</b>	<b>Authors</b>
<b>DS4B</b>	I	Corrosion of tubing taken from the high-pressure preheaters used in CANDU nuclear power plant	Manuela Fulger, Maria Mihalache, Lucian Velciu, Ileana Vitelaru
	II	Tritium and CANDU reactors – essential issues on tritium management	Raluca Fako, Virgil Ionescu
	III	ATHENA – experimental unit for the thermo-hydraulics of rapid lead-cooled reactors	Virgil Cojocaru, Pietro Agostini, Davide Rozzia, Marin Constantin, Radu Rucăreanu, Ileana Crețu
	Youth section	Optimum positioning procedure for seismic energy dissipation devices	Mădălina Angela Zamfir, Marian Androne, Gabriela Lungescu

## **DS5: Coal and clean coal technologies**

Five topics were subject to debates during the DS5 session, namely:

- Clean coal technologies;
- Coal mining and storage;
- Coal co-burning process;
- Modern mining methods, environmental problems;
- Modern solutions for the use of fossil energy products.

The **27 papers** presented during the session included analyses on issues regarding: the field of fossil resources, modern technologies for a high-quality capitalisation of coal by means of liquefaction techniques, importance of reducing the flue gases emissions, compliance with the environmental standards, status of lignite deposits and trends in the development of energy resources in the context of Horizon 2040.

Pragmatic debates also took place in regard to issues such as: the energy market and its constraints, design and development of NOx-reducing technologies, optimisation of functioning solutions for desulphurisation units. Concrete projects implemented by Oltenia Energy Complex and concerns for the future represented other topics subject to debate.

### **Conclusions and recommendations**

1. The medium and long-term national security requires the rational exploitation of non-renewable energy resources and the maximum possible extension of their end-of-life/depletion period.
2. The electricity market shall be subject to a rethinking process by reconsidering the entire mix of resources, in a balanced and optimised manner, based on the use of coal as the pillar of energy production, which should cover at least 30% of the market demand. In this context, Romania needs to implement a “capacity mechanism” component into the electricity market, so as to be able to provide the financial resources required to maintain the coal-based energy production capacities in an adequate state of operation in order for these capacities to operate effectively during the time intervals when the electricity production from renewable resources is unable to produce according to its installed capacity.



3. Continue the coal-based electricity supply and replacement of obsolete capacities with new condensation and cogeneration thermal-energy production capacities with high efficiency levels and supercritical parameters,
4. New technologies shall be considered, such as technologies for high-level coal capitalisation by means of liquefaction based on the use of low-pressure catalytic depolymerisation or indirect liquefaction methods.
5. The viable electricity production units based on solid fuel (coal) need to finalise the investments included in the environmental compliance programme.

Session	Prize	Paper	Authors
<b>DS5</b>	I	Solutions for optimising the flue gases desulphurisation unit processes – 330 MW Group – SE Rovinari	Marius Bâzgă, Adrian Bârlete;
	II	Coal – an ecological approach	Nicolae Iliăş, Iulian Offenbergh, Inga Roşioru, Aurelian Serafinceanu, George Teşeleanu
	III	Fitting the power plants of Oltenia Energy Complex with flue gas desulphurisation units, to reduce SO <sub>2</sub> emissions	Lavinu Danciu, Gabriel Chiot
	Youth section	Oltenia's lignite, the basis of Romania's energy strategy	Ionuţ Predoiu

# CORPORATE-LEVEL ROUND TABLE EVENTS

10 corporate-level Round Tables that brought important inputs to the analysis of specific energy industry issues were organised by national and international companies during the FOREN 2016 Forum.

Each session of discussions was attended by panels of more than 50 specialists, in average, and the debates were extremely spirited; the specialists analysed in an open, professional and passionate manner the most important current issues related to the energy and/or prospection or infrastructure systems specific to each corporation organising the round table.

The Round Table organised by the **Technical University of the Republic of Moldova**, with the theme “Intensify the processes to interconnect the energy sector of the Republic of Moldova with Romania’s energy sector”, was one of the most spirited events.

Organised in a novel and creative manner, the international workshop of VLER „Generation for Tomorrow’s Challenges” revealed the most important problems faced by today’s and tomorrow’s energy sector as well as how the young energy specialists are trained to overcome the challenges induced by a genuine change of the energy paradigm, based on a robust set of values accommodating the technological developments in the energy and environment sectors.

The main topics debated under the VLER workshop were:

1. Geopolitics of energy resources
2. Digital energy
3. Small producers and consumers (Prosumers)
4. Youth and Energy (TI.nerg)

The conclusions and recommendations formulated as a result of the VLER workshop were summarised in a final document known as „VLER Statement at FOREN 2016” and presented during the FOREN 2016 Closing Session.

# EXPOFOREN 2016

Expoforen 2016 provided the 30 exhibitor companies – notorious companies, important operators in the Romanian energy industry – with general exhibition stands where the participants presented their scope of activities and displayed their offers of products and services

## **Messages, conclusions and recommendations presented to the FOREN 2016 participants by the main decision-makers and operators**

### **Role of the National Energy System (NES) in the region**

- *„The Romanian Energy System is strong, robust and improving. There are areas faced with pressures or transformations, however these pressures are merely the sign of a reinvigoration, streamlining and improvement process”,* stated the Minister of Energy, **Vlad Grigorescu**, while substantiating his statement with concrete examples: Transgas has managed to obtain European funds for the BRUA Project; the connection between Romania and Bulgaria is due to be completed until the end of this year; Hidroelectrica will soon exit the insolvency status, as a company with an increased efficiency level and a package of shares will rapidly be placed on the international capital markets; the ambition to complete the national energy strategy, planned for by the end of 2016; the gas pipeline between Romania and Bulgaria.

- *„The future belongs to electricity and the solution will be given by a new technological and digital revolution.,* underlined **Iulian Iancu**, President of RNC-WEC during the FOREN 2016 opening session.

• „Due to its key-position in the region, Romania needs a regional-level approach. Our obligations at European level shall be transposed into the new National Energy Strategy (...) We have very good specialists who are internationally recognised, we have acquired experience as a result of successful projects we implemented in the past. Romania shall assert itself at international level (...) The European-level paradigm is changing. The share of renewable energy is increasing and therefore requires the development of interconnection lines and a better coordination at regional level (...) The young generation, with the assistance of those who have already gained experience in the field, may endeavour to build a future of its own. The train does not always stop twice in the same station – therefore young people shall valorise each opportunity they get”, stated Mrs. **Corina Popescu**, Secretary of State within the Ministry of Energy, as part of her global message conveyed during the FOREN 2016 events.

• „Keep all energy options open. We need each and every one of them: nuclear, renewable resources, coal, natural gas, oil. All these options are needed to cope with the increasing demand of the population, world-wide. All technologies present the potential of improvement in terms of their performance and quality” stated Mrs. **Elena Nechaev** – Director of Programmes within the World Energy Council, as her urge to the participants.

### **Natural Gas**

• „To enable that consumers be supplied from the most inexpensive resources, the domestic production prices should be set based on a free price mechanism. It is my belief that, together, we will find a solution for an analysis and decision in this respect, which will lead to the establishment of the lowest price for the household consumer. The final gas price will definitely not rise by 10%. The final price also contains other elements. We have the capacity to import at cheaper prices and this will lead in the end, under the worst case scenario, to an increase of just 2-3%. But it is exactly what we envisage, as a price adjustment for the domestic production would not be required”, stated Mr. **Niculae Havrileț**, President of the Regulatory Authority for Energy (ANRE).

• „ANRE should regulate the final gas prices for the household consumers until 2021, as set forth in the liberalisation schedule, in order to maintain the control including at the level of costs (...) We favour the idea of supplying natural gas to household consumers based on final prices regulated by ANRE until 30 June 2021 because such action, in our opinion, would enable ANRE to exert control onto the final price for supplying natural gas to household clients; such a control should also be exerted onto the level of costs, including onto the natural gas purchase price that the supplier shall justify as a price set according

to transparency conditions (...) The current liberalisation schedule envisages the full elimination of regulated gas rates for household clients, as of 30 June 2021”, stated, among others, Mr. **Aristotel Jude**, Secretary of State within the Ministry of Energy.

### **Energy transportation, distribution and storage**

• „Putting pressure on the entire domestic production currently obtained in Romania for the sole purpose of ensuring the sustainability of just one activity of the sector – regardless if such activity concerns storage, distribution or transportation – does not seem right to me. If we were to exert an administrative pressure onto the establishment of a price pertaining to the domestic production just to ensure the sustainability of a storage rate, we would risk diverting from the correct substance of the problem. The Regulatory Authority for Energy (ANRE) should support the streamlining and sustainability of storage, distribution or transportation rates and of regulated activities in general including in regard to the final regulated price of natural gas, and not to capitalise such rates by pressures exerted onto the domestic production price. According to ANRE reports, the distribution, storage and transportation rates account for more than half of the final gas price (...) ANRE adjusts the transportation rates yearly, based on supporting technical documentation. Forecasts are developed mainly in regard to quantities to be transported. The lower the volume, the higher the rate – and the other way around. It was found that the volume has increased therefore the rates should be adjusted, namely lowered. A debate is on-going for a 7% decrease of the transportation rate for the forthcoming period” – stated **Niculae Havrileț**, President of ANRE.

• „In Romania, gas distribution is not more expensive than in other European countries, but additional investments are still needed to upgrade the gas pipelines (...) If the talk about Distrigaz Sud Rețele (Distrigas Southern Networks), there are still 4,000 km. of pipelines to be restored in the southern part of the country (...) The investment required to restore these 4,000 km of gas pipelines amounts to euro 400 million”, stated Mr. **Eric Stab**, CEO of Engie Romania.

### **Black Sea gas**

• „The Black Sea will certainly not become a second North Sea. The exploration works only yielded positive results in Romania (...) In Turkey, which has the largest part of the Black Sea, the exploration works were not successful (...) The Black Sea explorations will only start if gas and crude oil prices increase and the gas transportation system is connected with the international markets

(...) *The domestic demand has decreased drastically, while the investors that will mine such deposits need an outlet market and the transportation of the gas from the maritime perimeters – which are quite far, 150-200 km. from the shore. So, we will have to wait*”, stated Mr. **Alexandru Pătruți**, Advisor to RNC-WEB.

### **Energy Storage**

• *„A household consumer can become energy-independent if he/she installs photovoltaic panels, for example, but also energy storage systems. Such storage technologies are currently extremely expensive, amounting to approximately Euro 5 million per MW, therefore state subsidies should be established for this purpose (...) Heating represents a major problem for all local authorities, a problem that could be solved also by the storage of thermal energy (...) A salt tank, to be heated to a very high temperature, accumulates a lot of thermal energy that can be released when needed – and it is therefore a thermal energy storage method. The heating energy peak loads are between 06:00 am and 07:30 am and then in the afternoon (...) There are two problems in regard to the storage of a MW – what is the power and what is the generated energy,”* stated, among others, Mr. **Viorel Gafița**, President of Romelectro.

### **Energy Mix**

• One of the themes debated during FOREN 2016 referred to “Fuel mix options in the region”. CE Oltenia presented the evolution of coal-based energy in the last years and indicated that the future of the coal raises a major question mark in the context of world energy policies. The market share of coal-based power plants is on a continuous descending trend. For example, on the day with the highest electricity consumption during the winter between 2011 and 2012, the production was mainly covered by the coal power plants (46.9 %), while this percentage reached the level of 33.3% on the day with the highest electricity consumption during the winter between 2015 and 2016. The theoretical purpose behind the restructuring of the electricity production sector through the setting-up of 10 independent units was to create competition on the domestic electricity market; however the decentralisation of the electricity production sector in Romania was far higher compared to the EU average. The current organisation, which is based on mono-fuel, is a unique model at least at EU level, which prevents a real competition on the electricity market while the production costs are not comparable.

## **European Energy Union**

• Mr. **Jyri Ylkanen**, on behalf of the Energy Directorate within the European Commission, offered a wider perspective on the themes approached under the current FOREN edition: „*Safe and Sustainable Energy for the Region*”. *Jyri Ylkanen presented in detail the meaning and objectives of the five pillars of the future European Energy Union: supply security, fully integrated internal energy market, energy efficiency, reduced CO2 emissions, research and innovation in the energy sector.*

## **Nuclear Energy**

• According to the statements of Mrs. **Daniela Lulache**, General Director of Nuclearelectrica, „The negotiations on the execution of reactors 3 and 4 in Cernavodă, held with the Chinese company, aim at attracting an investor to contribute financially to the execution of these units and not to supply equipment. When asked whether the negotiation partner, the Chinese company, intends to bring equipment from China for reactors 3 and 4, Mrs. **Lulache** stated: „*The negotiation does not concern the actual building of reactors 3 and 4; we are negotiating with an investor that would contribute financially to the design company*”.

## **Smart Meters**

• Mr. **Eugen Scheuşan**, General Director of Electromagnetica, stated „*Smart meters should be installed in parallel with the upgrade of electrical installations in the clients' households, as some of these installations are older than 40 years. The new meters will not be able to generate direct benefits to consumers. (...) The obligation to upgrade the installations, which is foreseen, should somehow be implemented. Furthermore, based on consumption data provided by the smart meters, providers can offer customised subscriptions. The new tariff plans, established based on the consumption tree, will present advantages both to clients – as the tariffs could be lower than the current ones – and to suppliers – who will be able to better manage their energy purchase and delivery flows*”.

# GENERAL CONCLUSIONS AND RECOMMENDATIONS

- 1.** The organisation of FOREN 2016 at the level of the Central and Eastern European Region was appreciated by participants as a successful event and the Romanian National Committee of the World Energy Council made significant efforts to meet the expectations of specialists attending the event;
- 2.** Essential themes were debated which were focused on meeting the energy, oil, coal, nuclear, renewable resources requirements while limiting the carbon footprint, so as to ensure the sustainable development of both the energy sector and of the economy as a whole.
- 3.** The issues subject to analysis were mainly focussed on topics such as modern energy accessibility, energy availability and the effects of the energy sector onto the environment;
- 4.** The smart use of renewable energy resources and of nuclear groups, the implementation of environmental pollution alleviation solutions in the electricity power plants and the development of smart methods for fossil fuels burning are all elements which can enable Romania to fully meet the EU requirements on reducing the carbon footprint to values below 450 ppm;
- 5.** The Round Tables organised during FOREN 2016 provided the participants with an opportunity to bring important inputs to the settlement of major problems that the energy systems are confronted with;
- 6.** The corporate-level Round Tables, organised by renowned entities operating in the energy sector, analysed the main challenges faced by such entities in the process of ensuring the sustainable development of the energy sector.



- 7.** The development of the Romanian energy sector requires an increased attention given to the research and development sector – which will have to provide the basis for a viable energy strategy of the future;
- 8.** Energy is the key to development. The focus is on the need to confine the disturbances that the technological development and the irrational use of resources exert onto the “human-nature” system (a reasoning of the type “Full planet, empty plates” cannot be applied);
- 9.** The energy sector operators shall have the energy Consumer as the centre of their attention;
- 10.** Romania shall strengthen its position (voice) in the EU-level discussions concerning the future model of the European energy market;
- 11.** A special focus shall be placed on the human resources, namely to ensure the training required to meet the targets set for 2035 and even for 2050.
- 12.** There is a need to ensure the protection of both electricity and natural gas vulnerable consumers, in due consideration of the major implications related to the energy equity and accessibility indicator;
- 13.** The presented papers outlined the vision of today’s vision of the European energy policy which corresponds to the sustainable development concept and refers to important issues including: energy efficiency increase, sustainable development of energy production, transportation and use/conversion, safety of energy supply and reducing the greenhouse gas emissions through the development of smart cities and of the electro-mobility sector.

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