



## COLOMBIAN NATIONAL COMMITTEE 2018

### FIRST IBEROAMERICAN SEMINAR CIGRE

### NEW HORIZONS OF THE ELECTRICITY SECTOR AND CHALLENGES FOR COLOMBIA

MEDELLIN MAY 28- 29 2018

#### Event Opening

The opening of the first Ibero-American Seminar was made by the Colombian Minister of Mines and Energy Mr. Germán Arce. He expressed his deepest concern on system risks. He emphasized the importance to manage contingency plans to generate early warnings, hence minimize and mitigate risky situations that might impact on society and companies.



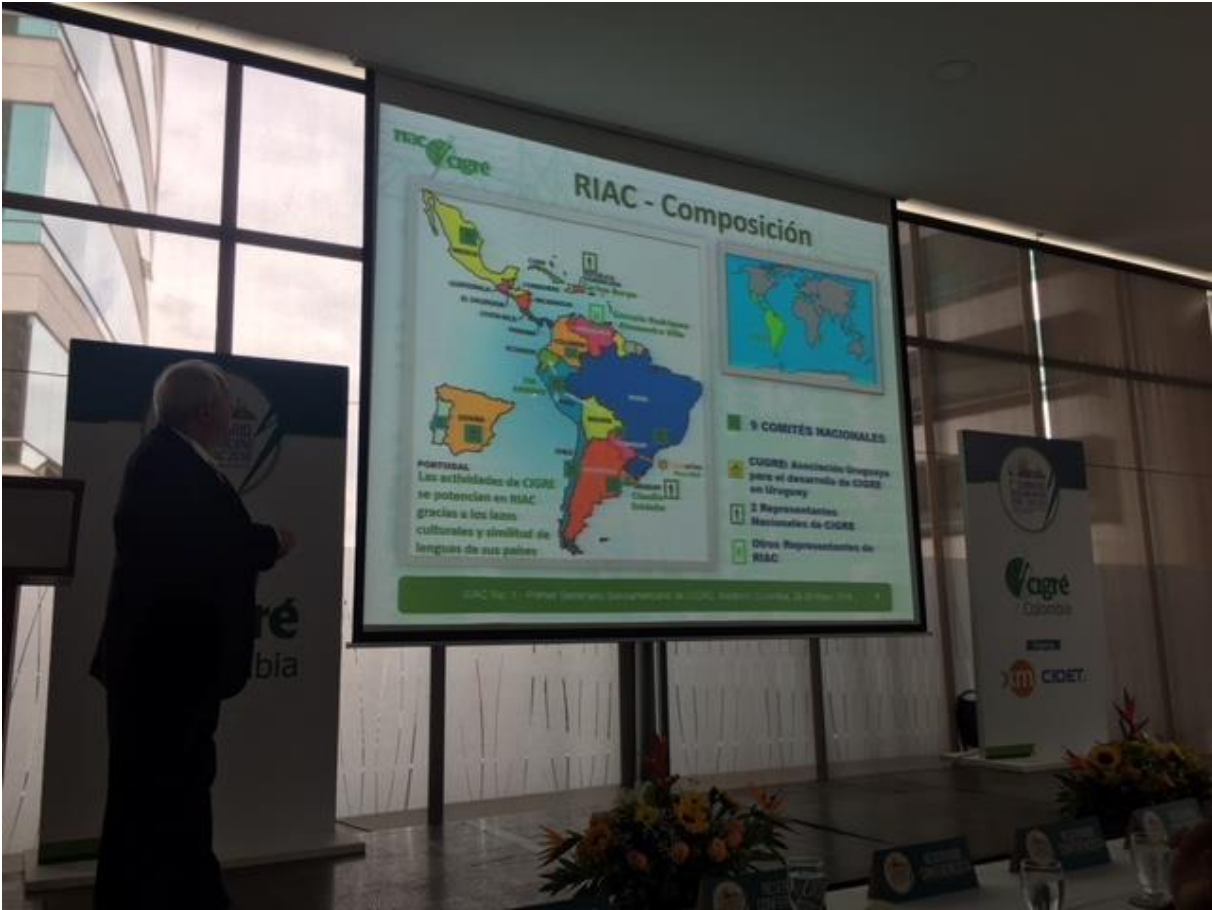
Mrs María Nohemi Arboleda, Colombian CIGRE President, welcome authorities of CIGRE Paris, Brazil and ERIAC She also expressed her gratitude to the members of CIGRE Colombia for the support to this event that analyse the challenges of the electricity industry in Colombia.



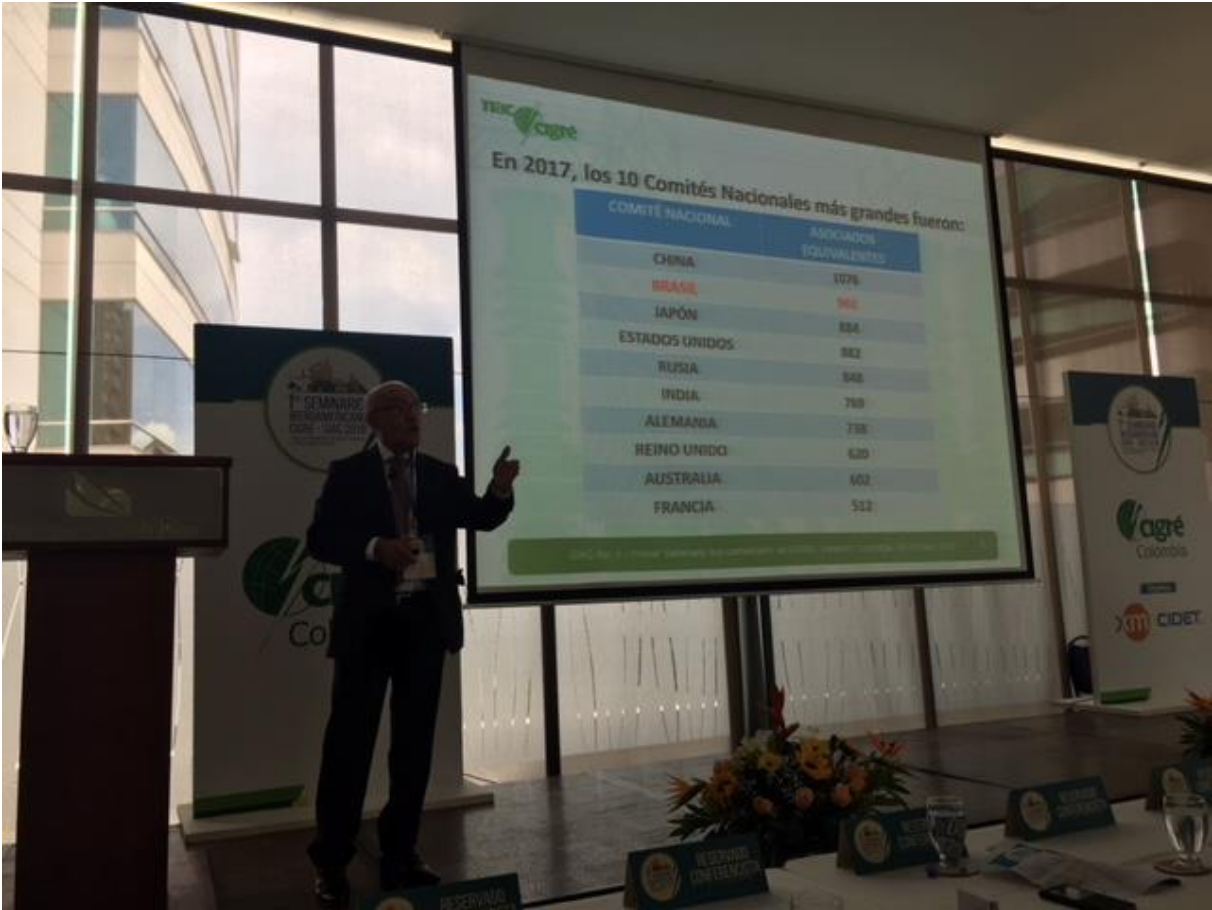
Mr. Philippe Adam, General Secretary CIGRE Central Office made a presentation on on the electricity supply of the future and the roadmap of CIGRE . Mr Adam explained how CIGRE is an global organization with presence in 58 committees. Emphasizes that there are approximately 10,000 members and more than 4,000 experts working in the 16 Technical Committees. It explained the main events organized by CIGRE, its periodicity, type of publications, among others. Mr Adam presented the main 10 areas for CIGRE working groups.



Mr. Jorge Nizovoy , president of RIAC presented the CIGRE work in Ibero-America. He explained the National Committees in different countries around the world and the role of RIAC in regional events. It was presented the ERIAC events in odd years having as a country host Brazil, Paraguay and Argentina. The next event will be organised by CIGRE Brazil. Highlighted the keys aspects to submit work proposals to Technical Committees. He talks about the agreement that RIAC has with CIER and ends with a message for industry leaders showing the benefits and benefits of belonging to CIGRE.



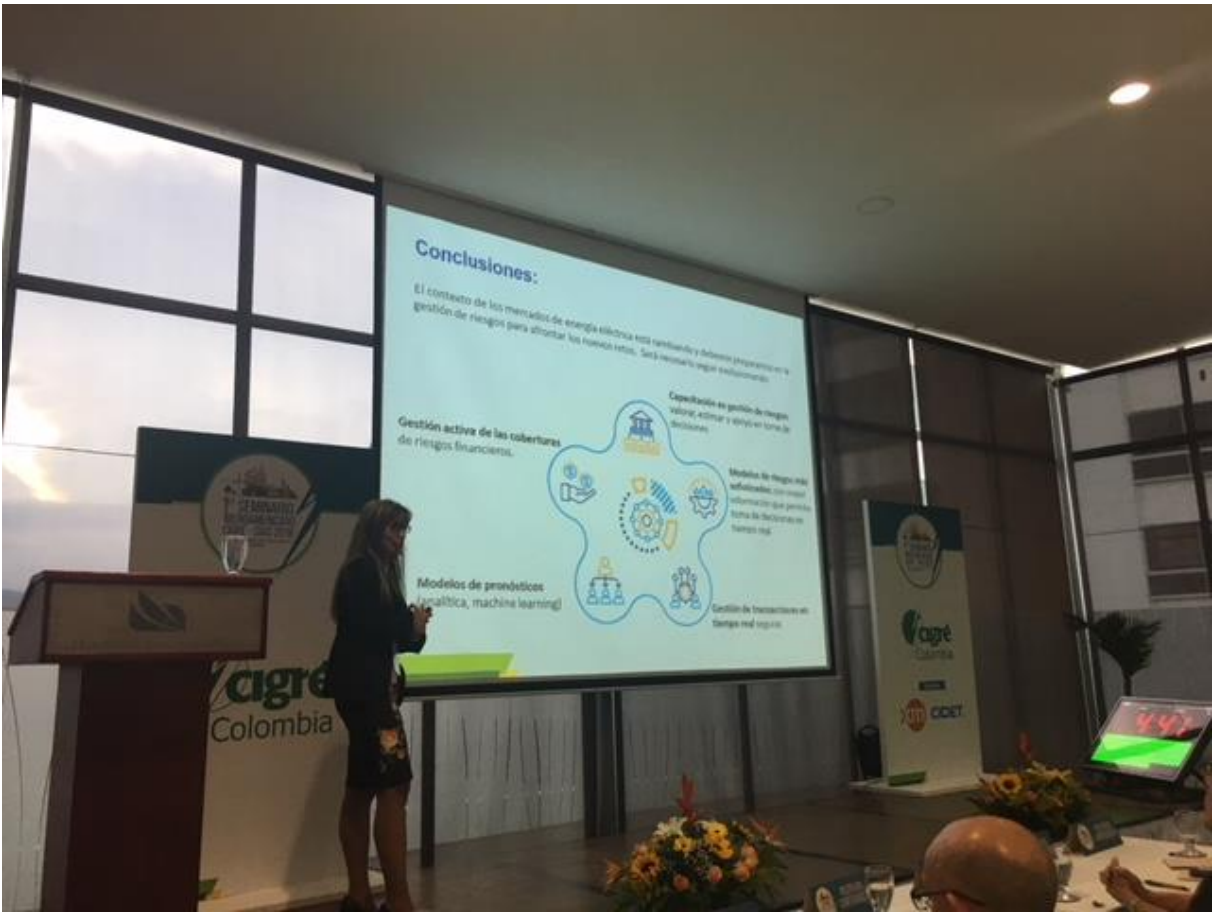
Josias Matos de Araujo, President of CIGRE Brazil, shared the good practices of this National Committee, being the second largest in the world after China, and created in 1971. It was presented the structure, mission, values and vision of CIGRE Brazil. Mr. Matos explained good practices to disseminate the work not only in magazines but also with books prepared by the Brazilian Committee. As a good example for CIGRE community is the active participation of Brazil in all 16 Technical Committees.



Sergio Barrientos, Member JWG C1 / C6-37 CIRED and Chilean representative in SC C6 CEO Surenergia S.A. – Chile, presented the impact of distributed generation in the Chilean System and the scope for regulation in distribution. He showed the key elements and shared the experiences and importance of having distributed generation with an important penetration in a power system.

Mr. Carlos Mario Correa, representing XM Colombian Independent Operator, presented the integration of renewable sources to the operation of the system in Colombia. He explained that this topic is not new and is already a reality. It starts with international experiences, then focused on the Colombian case, showing in figures the current scenario, highlights the challenges and future operational impacts , such as addressing these operational difficulties . Guides for good practice are presented. They have been developed by XM and other companies ( CAISO, PJM, MISO, ERCOT, UTE, Fraunhofer, Vestas , Enercon , among others). Details of how Colombia is approaching the subject are presented from the competences, regulatory proposals, prototype of forecast, process changes, among others.

Mrs Martha Gil, from XM Colombian Independent Operator, presented the main issues regarding risk on Renewable resources. He showed the new value chain and the new context in the energy markets. This new chain offers transformations and also risks. P2P technology and platforms are incorporated, BlockChain technology is used through intelligent contracts. Some adjustments are required to achieve a complete market in Colombia. It is clear that we need an intraday market. It is expected that in the short term the Colombian Regulatory body (CREG) will rule these new aspects. Colombia has faced risk of price volatility, credit and counterparty, also risk of large agent (largest marketer in Colombia) that as a domino effect collapses the entire system. Financial risk in Colombia is related to the volatility of prices due to the effects of El Niño phenomenon. New tools are needed to manage risks, risk analytics, scenario identification, simulations. The company Derivex offers a scheme to mitigate risks in the Colombian market. Finally, Mrs Gil presented the XM action plan to face this new panorama. It is concluded that risk management requires strengthening of competencies



Mr. Guillermo Bautista from CAISO made his presentation on market of electricity and energy balance. Presented flexible markets and relevant statistics on the system Operation in California. Mr Bautista presented the demand growth by the effect of renewable energy in the system. He showed the penetration of solar energy in California and reveals the main operational challenges, as well as the way markets have become more flexible in order to face the new challenges of solar and wind energy.





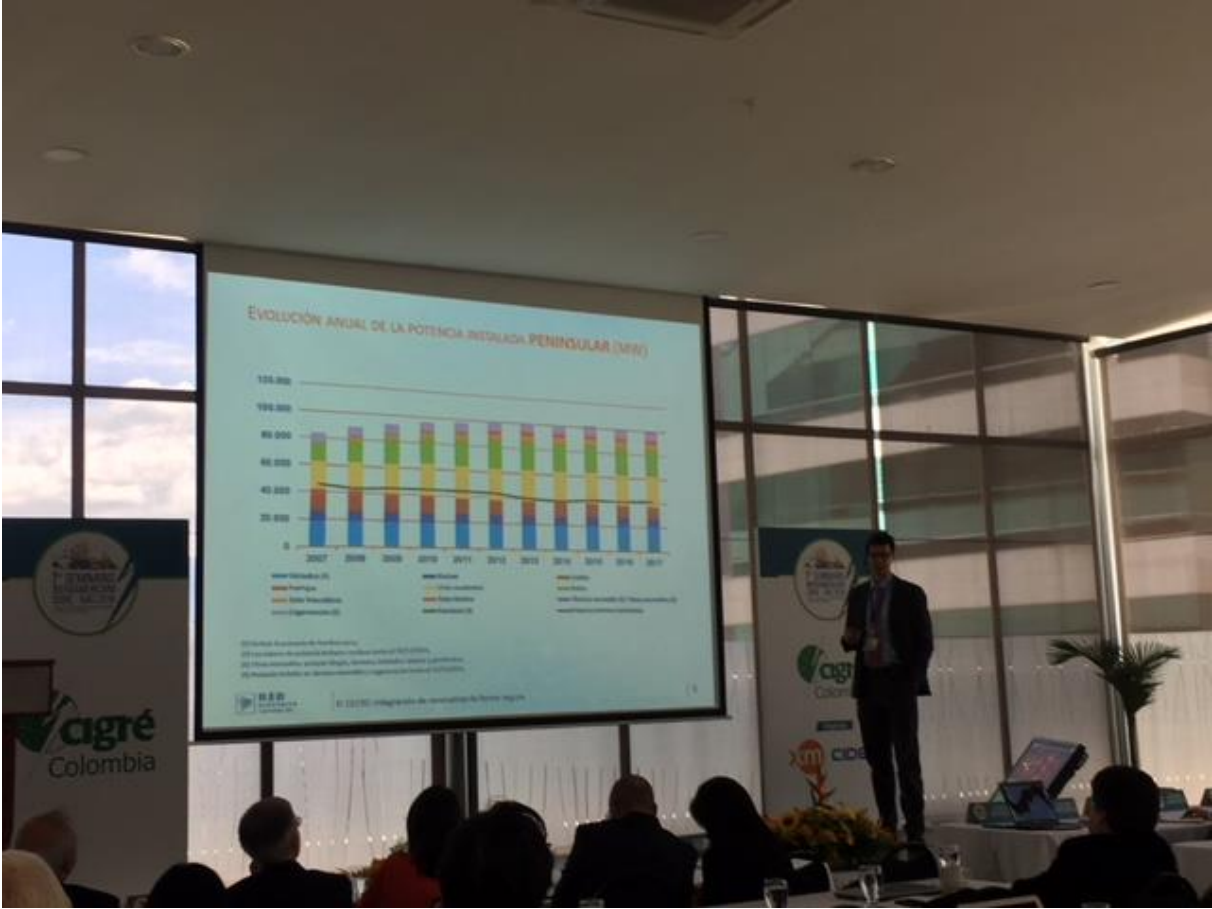
Mr. Bernardo Vargas, CEO of Grupo ISA, made his presentation on the future electricity in Latin America. He explained that today's world is evolving as a result of macro trends that have global impact. It also presented trends and their main impacts in LATAM. He emphasizes that we must be prepared for the paradigm changes and learn from the developed countries that have already faced and started the experience with renewable energies. CIGRE is a great stage and opportunity to share experiences. One of the most important aspects to face these new challenges is the people. Mr. Vargas concluded that in LATAM it is important to prepare for possible disruptions in different business areas. The challenges are great and the prospective analyzes agree that technology will be a key factor to success.



Mr. Valdson Simoes, Professor of the University of Pernambuco and Transmission Planner Eletrobras (Brazil) , also member of CIGRE and leader of working group C1.27 presented the future of reliability in light of the new levels of flexibility offered by customers and system operators. He explained the scope of work group C1. 27. The need to change the concept and the definition of reliability is highlighted. Mr. Simoes presented examples of new technologies in other countries. The new planning standards and the new factors that affect reliability are explained. The new definitions of reliability are highlighted.

Mrs Maria Claudia Álzate from the Colombian Regulatory body (CREG) presented the regulatory requirements to incorporate the technological advances of the electricity industry . She summarized the regulatory framework of our country in particular related to renewable energy. It presents new technologies, distributed generation, small and large scale self-generation. She explained the indicators for monitoring and evaluating the integration of renewable energy, specifically want to know the benefits offered with is and kind of energy. Regarding smart metering, She explained the the target fot 2030 is to have at least the 95% of urban users and 50% of rural users under new smart measurement. The rules for the adaptation of the integration of solar and wind power plants are being adjusted. It is explained that several consultancies are being carried out, one dealing with the new network code, another on the binding dispatch and the intraday market. The need for new complementary services is also analyzed. Finally, the new challenge is outlined by the dynamism of the market due to the entry of new technologies and participants.

Mr. Jorge Hidalgo López from REE- Red Eléctrica de España presented the integration of renewables safely in a weakly interconnected system. It starts with the main European market figures and details of Peninsular electricity system in Spain. The integration of renewables has been marked by European regulation, accounting for 37% of the coverage of total demand. The characteristics of the interconnections with other countries are presented. The importance of interconnection with France as a backup in case of operational emergencies is highlighted. The different renewable technologies (wind, photovoltaic and thermosolar ) and the standards they must comply with are explained . It is emphasized that the variability of renewables is compensated by a good observability of the system, otherwise the security will be affected or reserves will be increased. In Spain there are 30 control centers for renewable energies. It is concluded that renewable generation actually is more flexible and uncertainty is mitigated by increasing manageable generation.



Sergio Barrientos, CEO of Surenergia SA - Chile presents the optimal investment decisions in transmission and distribution due to the growing uncertainty of the energy scenario . It highlights the main work milestones of the CIGRE C6 Study Committee.

Valdson Simoes , Professor of the University of Pernambuco and Transmission Planner of Eletrobras (Brazil) , also member of CIGRE and leader of working group C1.27 makes another presentation about the development trends of the energy systems of large cities and metropolitan areas taking into account the new generation of generation, networking and information technologies . Presents the characteristics of the main cities in terms of electricity consumption

Panel - Challenges of the actors :

Moderator Pablo Corredor General Manager PHC

Vision of the generator Diego González Generation Manager ISAGEN

View of the Transmission César Ramírez ISA Technical Vice President

Vision of the Distribution Juan Carlos Duque Distribution Manager EPM

Vision of the Retailers Juan Ricardo Montalvo General Manager VATIA

Vision of the market Operator Jaime Alejandro Zapata Manager National Dispatch Center and Secretary CIGRE COLOMBIA .

