

# **Up to 100% Integration of RES – Network Codes Impact**

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**IEEE PES Innovative Smart Grid Technologies, Europe**  
**Torino, Italy, 26 September 2017**

# ROMANIAN ENERGY CENTRE – CRE

- The Romanian Energy Center is a **non-governmental and non profit Association** representing the interest of state-owned and private companies operating in the Romanian Energy Market, in relation with EU and National Institutions;
- Active in all relevant areas including: **electricity, oil and gas, coal, renewables, energy equipment and services plus R&D&I and Legal assistance;**
- CRE contributes to the European and National **decision-making process**, promotes infrastructure investments and supports the transition to a decarbonized energy system.



# ROMANIAN ENERGY CENTRE MEMBERS

## 16 Members from Public and Private Sector

- ADREM INVEST
- BIOENERGY
- CEZ România
- Complexul Energetic Oltenia
- CONPET
- ELECTRICA
- ECRO
- E.ON România
- ENERGOBIT
- EXIMPROD
- POWER STUDIES and DESIGN INSTITUTE
- ROMGAZ
- TRACTEBEL ENGINEERING – GDF SUEZ
- TRANSELECTRICA
- TRANSGAZ
- ȚUCA ZBARCEA & ASSOCIATES



## CRE – MAIN ACTIVITIES



**Position papers to Romanian and European Energy Policy consultations**



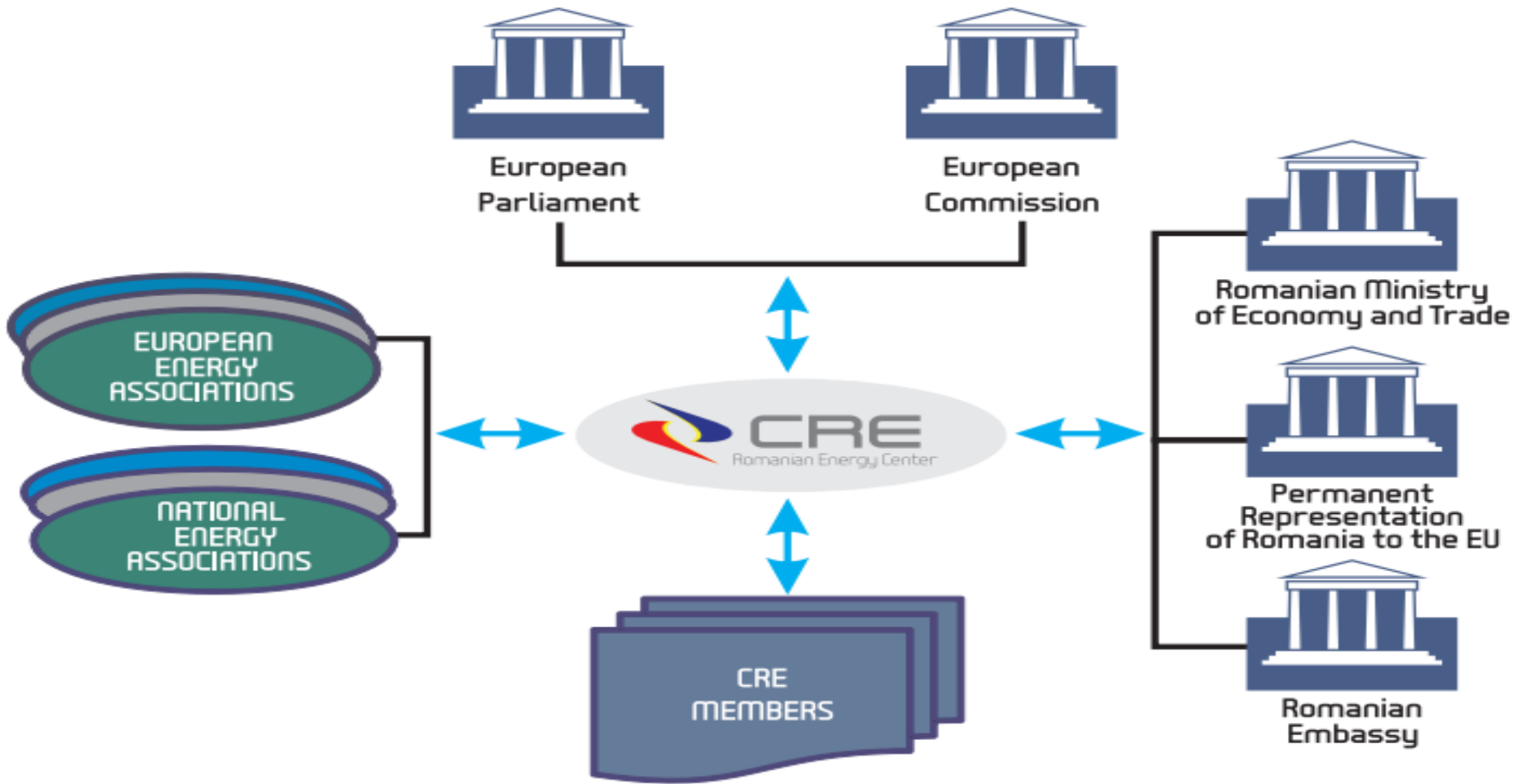
**EU Projects**



**Events in Romania and Brussels**



**Coordinator of the Center for Dialogue and Cooperation 16+1 – China CEEC**





# RESERVE – RENEWABLES IN A STABLE ELECTRIC GRID

- Future energy systems will use renewable energy sources to minimize CO2 emissions.
- RESERVE will address this challenge by researching new energy system concepts, implemented as new system support services enabling distributed, multi-level control of the energy system using pan-European unified **network codes**.
- RESERVE results include published models of system support services, innovative architectures for the implementation of the services, performance tests on pan-European real-time simulation, and live, test-beds, a model for **pan-European unified network codes** and actions to promote results to standardization organisations,



Coordinator: **Ericsson GmbH**  
Consortia: **11 Partners**

# CURRENT SITUATION OF THE NETWORK CODES IN ENTSO-E

- **Entered into force**
  - ✓ **Capacity Allocation and Congestion Management;**
  - ✓ **Requirements for Generators;**
  - ✓ **Demand Connection;**
  - ✓ **High Voltage Direct Current;**
  - ✓ **Forward Capacity Allocation.**
- **Validated by Member States, awaiting validation by European Parliament and Council and entry into force**
  -  **Electricity Balancing;**
  -  **Emergency and Restoration;**
  -  **System Operations Guidelines (result of merging the following codes: Operational Security, Operational Planning & Scheduling and Load Frequency Control & Reserves).**

## RESERVE ROLE REGARDING THE NETWORK CODES

- Existing codes very well fitted with the existing situation: up to 20% renewable energy;
- Existing codes are usually not fitted with higher level of renewable energy penetration;
- Modification or/and new codes approval process is very slow;
- Harmonization among the members is also a slow process.
- RESERVE projects has to identify the gaps between the current situation and the future conditions.

20% →    → 100%



# ASSESSED IMPACT ON THE EXISTING NETWORK CODES

|   |   |             |
|---|---|-------------|
| Capacity Allocation and Congestion Management | - | significant |
| Requirements for Generators                   | - | strong      |
| Demand Connection                             | - | weak        |
| High Voltage Direct Current                   | - | strong      |
| Forward Capacity Allocation                   | - | significant |
| Electricity Balancing                         | - | strong      |
| Emergency and Restoration                     | - | strong      |
| System Operations Guidelines                  | - | very strong |
| Distribution codes                            | - | very strong |
| Possible new code for <b>STORAGE</b>          |   |             |

# POSSIBLE PROPOSALS TO BE IMPLEMENTED IN FUTURE NETWORK CODES

- Changing of the **frequency definition**
- **New RoCoF definition** and **new requirements for RoCoF control providers**
- New Requirements for **power converter-based ESSs** connected to the transmission grid
- **Standardization of PMU characteristics** and monitoring issues
- **New approach for primary and secondary control**
- New approach for the **TSO – DSO collaboration**
- Recommended practice for maintaining the inertia level / providing synthetic inertia
- **Changing the approach for storage**
- **Free database for network calculations**
- Definition of **Virtual Power Plants**
- **New collaboration between generators and DSO's** for voltage control
- **New requirements for generators connections.**

# HOW TO CHANGE THE NETWORK CODES

- **Develop a powerful set of technical and financial arguments.**
- **Create awareness among the Transmission Operators.**
- **Create awareness among the Distribution Operators.**
- **Create awareness among the Market Operators.**
- **Create awareness at European Union level.**
- **Create awareness at investors level.**
  
- **Supporting the process by providing technical and financial solutions.**
- **Supporting the process by providing new devices.**

# THANK YOU FOR YOUR ATTENTION!

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