



Transelectrica®

Compania Națională
de Transport
al Energiei Electrice

WE LEAD THE POWER

CHALLENGES IN INTEGRATING RENEWABLE ENERGY IN THE NATIONAL POWER GRID SYSTEM

TSO's role and responsibilities

- In charge for the safety in operation of the NPS;
- Physical support for the electricity markets (bilateral, day ahead, balancing);
- Balancing market administrator;
- In charge for the safety in operation and commercial arrangements on the interconnections;
- In charge for the NPS operation in accordance with ENTSO-E standards, principles and rules;
- In charge for the development of the infrastructure for supporting the national energy policy on medium and long term

Present situation regarding the REE

- Small hydro (<10 MW) : ~ 70 MW in operation;
- Wind generation: ~ 450 MW in operation (testing period);
- Solar generation (photovoltaic) : no significant projects yet;
- Bio – mass: ~ 8 MW in operation

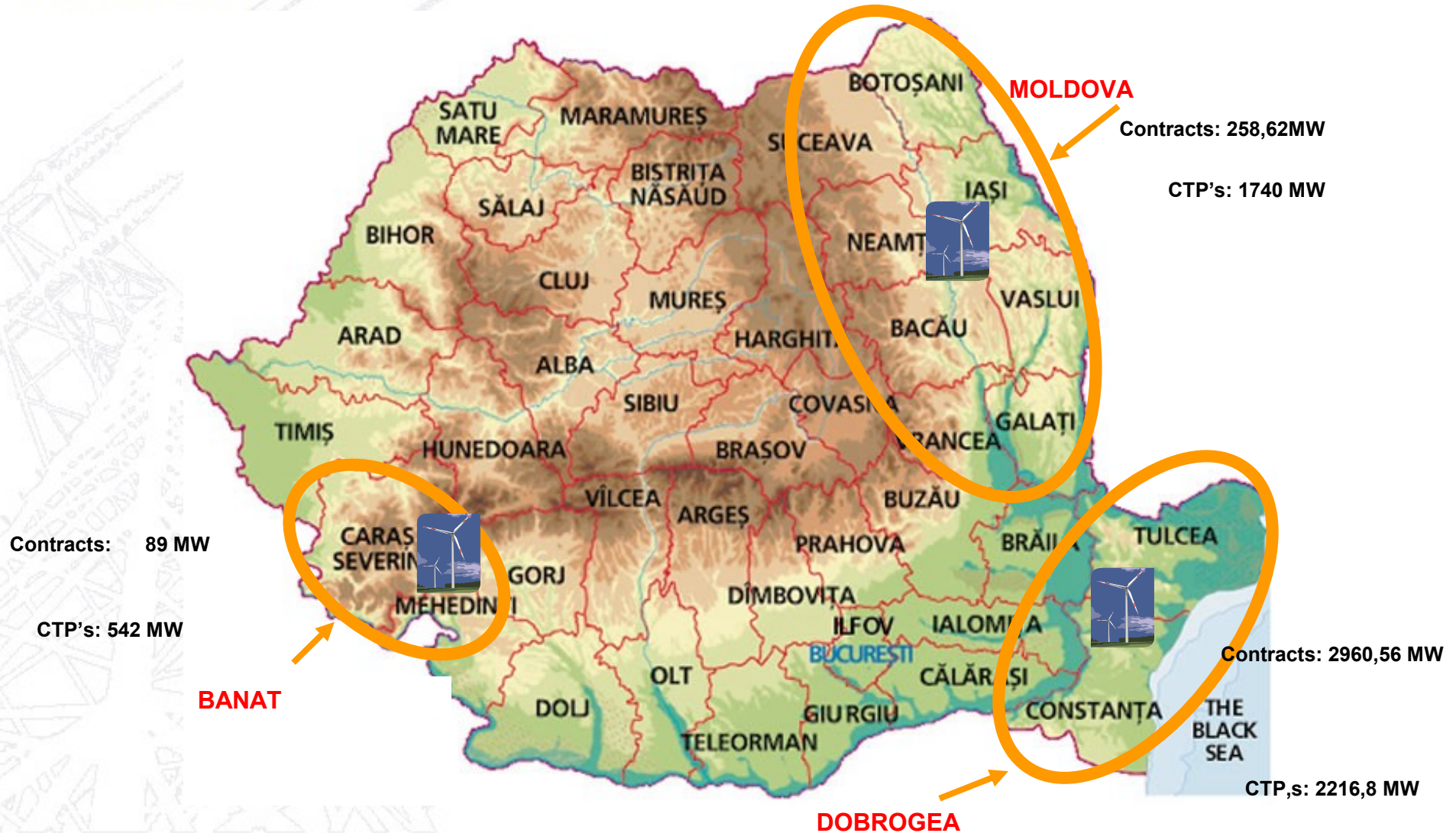
Present information drive us to the conclusion that wind generation has the modt important potential as compared with the other renewable energies in Romania; therefore we are expecting significant development mainly in this direction.

Advanced projects for wind generation

No.	Operator in charge for contract / CTP issue	Installed power [MW]	
		Contracts	CTP*
1	Transelectrica	3.302	3.788
2	Electrica Muntenia north	584	396
3	Electrica Transilvania north	0	84
4	Enel Muntenia south	0	26
5	Enel Banat	252	274
6	Enel Dobrogea	2.196	129
7	E.ON Moldova	98	354
8	CEZ Distribution	0	50
9	NPS Total	6.431	5.101

* - It is well known that Connection Technical Permit (CTP) have a validity duration of about 12 months

Areas with highest wind potential



Main challenges for integrating REE

- **Power network development**
- **Balancing issues**
- **Testing procedures**

Power Network Development

Main obstacles:

- Identification of the financing sources. The investments package requires more than 200 mil. Euro generating big difficulties for the TSO.
- Time frame for construction of the transmission projects is much larger than the duration for a wind farm. The legislation regarding the land acquisition is not very supportive from that point of view.



Transelectrica - Rețeaua Electrică de Transport din România



Balancing Issues

- Characteristic elements for the Romanian PS:
 1. Net peak load is around 8500 MW in winter and around 7000 MW in summer;
 2. Net light load is around 5500MW in winter and around 4500 MW in summer;
 3. Hourly average consumption is around 6200 MWh/h;
 4. Over 4000 MW between maximum peak load and minimum light load per year;
 5. Over 2000MW between maximum peak load and minimum light load per day.
- Presently the projects are exceeding 10 000 MW.

Balancing Issues

- Transselectrica has developed an internal procedure to assess the maximum amount of installed power in wind generation that can be integrated into the PS while keeping the reliability standards of the system. According to this procedure:
 - The basic input is the existing reserve (based on the last year);
 - Probability for wind generation curtailments is less than 10%;
 - In present condition Romanian PS can integrate around 3000 MW installed power in wind generation.

In order to increase the limit mentioned above it is needed to increase the reserves.

Testing procedures

- Transelectrica has developed a specific procedure in order to test the units before putting in operation.
- Characteristics of REE in Romania:
 1. Large farms;
 2. 3 areas of interest;
 3. High level of uncertainty regarding the finalization of the projects.