



Transelectrica®
Company with a Dualist Management System

RES - GRID ACCESS ISSUES

Access to the Grid 2013
March 27, 2013
Hotel Intercontinental Bucharest



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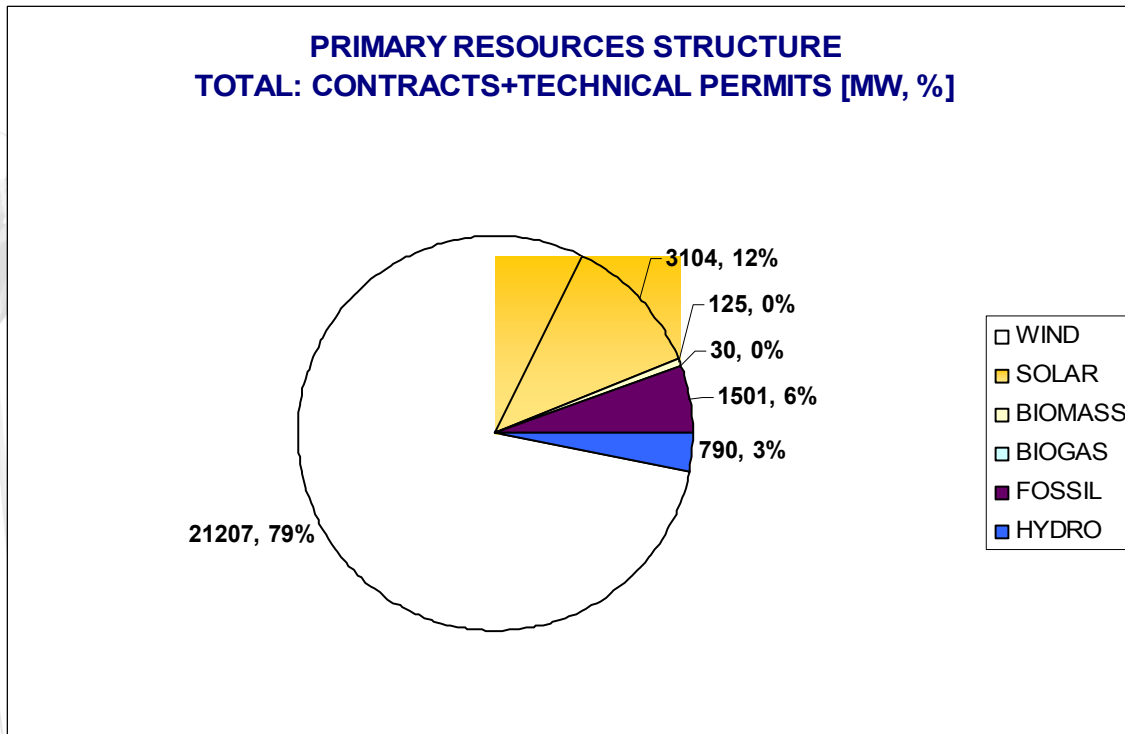
TSO's role and responsibilities

- In charge for the safety in operation of the National Power System;
- 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



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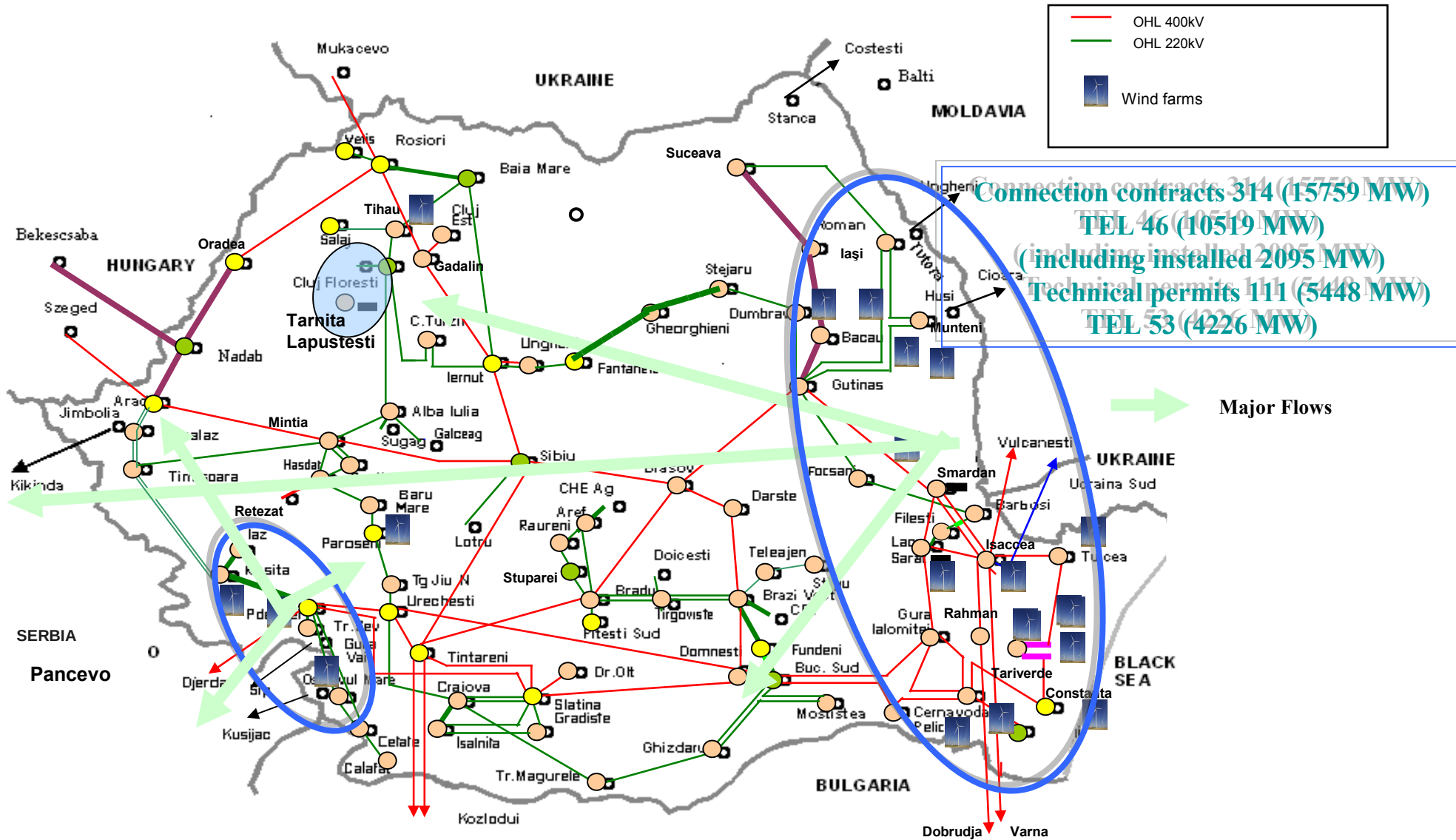
Primary Source	Contracts (~ 3000 MW already installed) [MW]	Technical permits [MW]
WIND	15759	5448
SOLAR	1010	2094
BIOMASS	73	52
BIOGAS	4	26
FOSSIL	1015	486
HYDRO	383	406
TOTAL	18245	8511
out of which TEL	11433	5143



Main generation
already installed:

- OMV Petrom 893 MW
- Wind 2095 MW
- PV 94 MW
- Biomass 40 MW

ROMANIA - WIND GENERATION CONCENTRATION

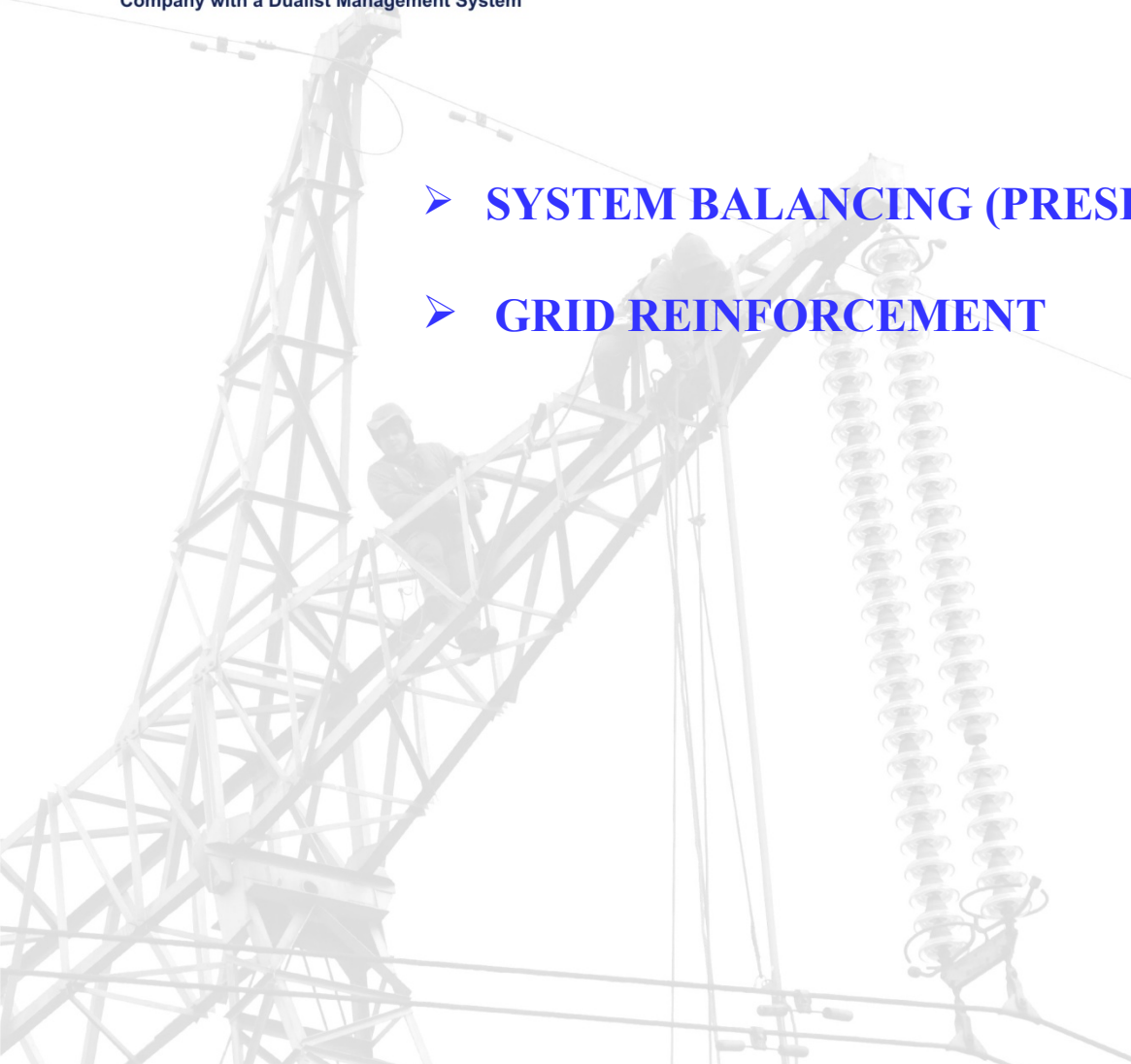




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- **SYSTEM BALANCING (PRESENT SYSTEM LIMIT ~3000 MW)**
- **GRID REINFORCEMENT**



Grid Issues



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TRANSELECTRICA DEVELOPMENT PLAN

MAIN GRID REINFORCEMENTS FOR WPP ACCOMODATION

No.	Project Description	Estimated commissioning
1	Connection of power station Medgidia in OHL 400 kV Issacea (RO) - Varna (BG) and Isaccea (RO) - Dobrudja (BG)	2016
2	OHL 400 kV d.c. Smardan - Gutinas	2020
3	OHL 400 kv d.c. Cernavoda - Gura Ialomitei - Stalpu	2019
4	Upgrade to 400 kV OHL Stalpu - Teleajen - Brazi	2018
5	OHL 400 kV s.c. Suceava - Gadalin	2023
6	OHL 400 kV d.c. Medgidia - Constanta	2023
7	OHL 400 kV s.c. Portile de Fier - Resita	2017
8	OHL 400 kV s.c. Romania - Serbia	2015
9	Upgrade to 400 kV Resita - Timisoara - Sacalaz	2023

* the total investment program amounts to about 600 mil. Euro

Grid Issues



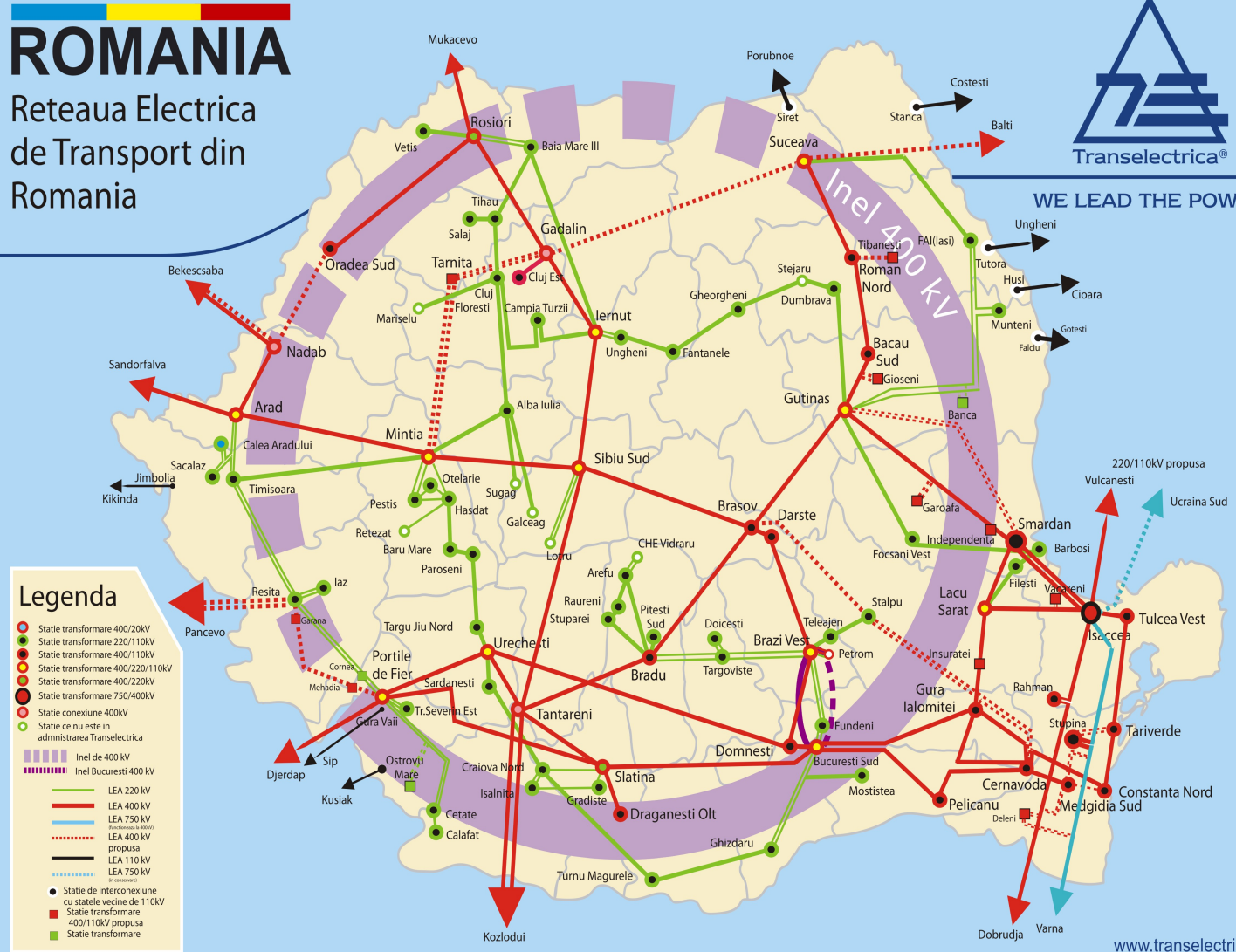
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ROMANIA

Reteaua Electrica de Transport din Romania



WE LEAD THE POWER



Legenda

- Statie transformare 400/20kV
- Statie transformare 220/110kV
- Statie transformare 400/110kV
- Statie transformare 400/220/110kV
- Statie transformare 400/220kV
- Statie transformare 750/400kV
- Statie conexiune 400kV
- Statie ce nu este in administrarea Transelectrica

- Inel de 400 kV
- Inel Bucuresti 400 kV
- LEA 220 kV
- LEA 400 kV
- LEA 750 kV (Bucuresti-Cluj)
- LEA 400 kV propusa
- LEA 110 kV
- LEA 750 kV (Bucuresti)

- Statie de interconexiune cu statele vecine de 110kV
- Statie transformare 400/110kV propusa
- Statie transformare



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Power Network Development

Main obstacles:

- Identification of the financing sources. The investments package requires more than 600 mil. Euro generating big difficulties for the TSO.
- Time frame for building a line is much larger than for building a wind farm. The legislation regarding the land acquisition is not supportive from that point of view.

Balancing Issues



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- 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 16 000 MW.

Balancing Issues



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REQUIREMENTS FOR SYSTEM BALANCING

GENERATION FORECAST

GENERATION CONTROL



BALANCING MARKET PLATFORM

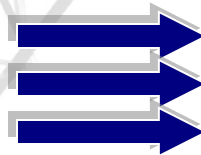


**CENTRAL WIND MANAGEMENT SYSTEM
REGIONAL SYSTEM MANAGEMENT SYSTEMS**



GENERATION ACCESS AND CONTROL RULES

GENERATION PARK FLEXIBILITY + STORAGE



**PUMPED STORAGE PLANT TARNITA LAPUSTESTI
HYDRO UNITS
FAST START GAS UNITS**



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- Energy generated by WPP has priority status.
- RES generators sell their energy on the electricity market, for the market price.
- In the first decade of December, ANRE publishes on its site the estimated annual mandatory quota of green certificates to be acquired the next year, the estimated number of GC issued, based on existing information regarding generated RES next year and the final gross consumption estimated for next year.
- By the 15th of April of each year, ANRE determines, for each supplier and for each of the individual producers who have the obligation to acquire green certificates, the degree of individual fulfilment of the annual mandatory green certificate acquisition quota of the previous calendar year, based on the information about the number of green certificates acquired and on the electricity consumed/supplied for consumption.

The volume of GC which shall be bought is exactly determined through the annual mandatory quota that the suppliers have to acquire.



National Power System capacity to integrate WPP



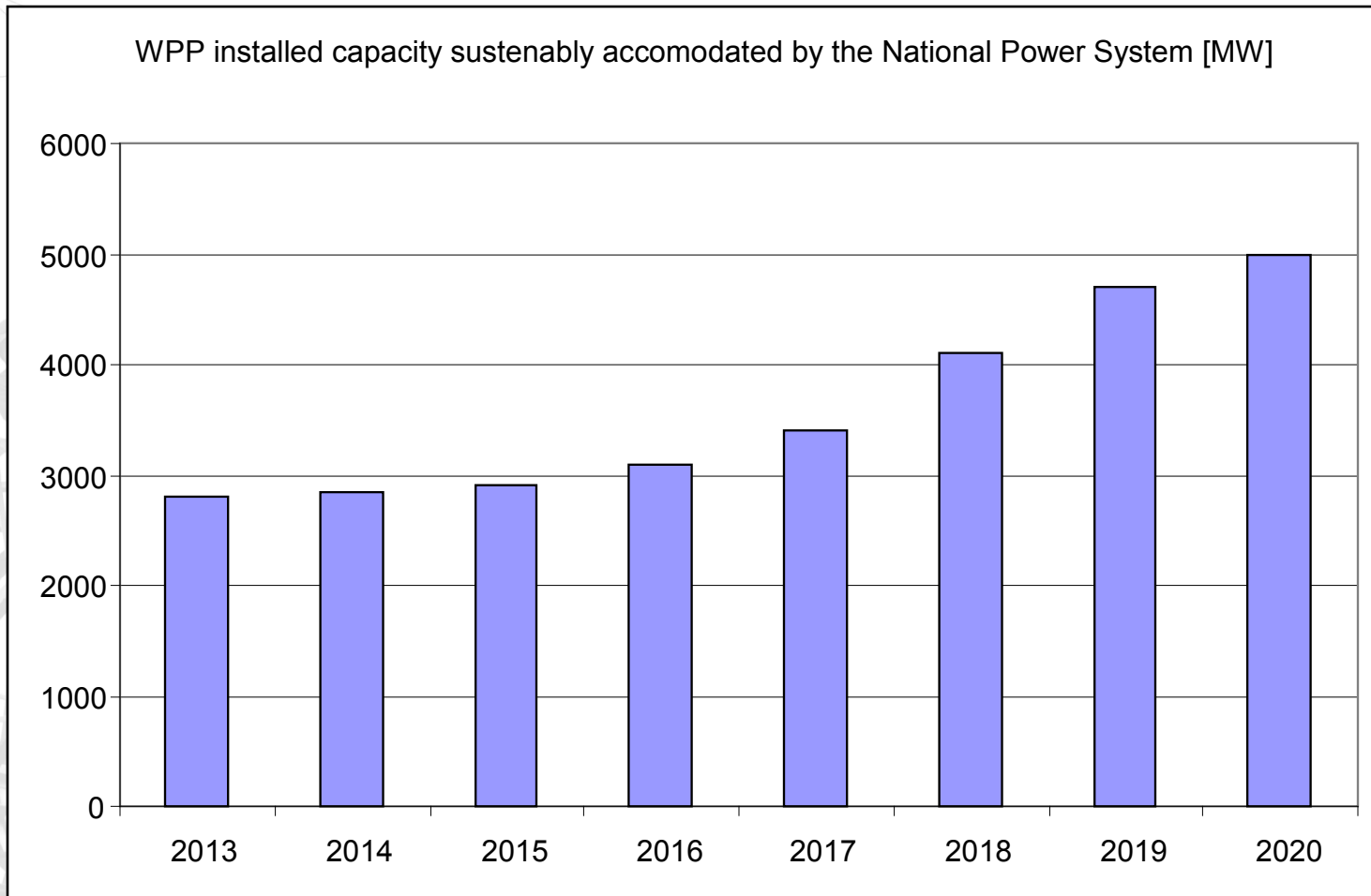
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Forecast of installed capacity in WPP which may be sustainably integrated by the National Power System

Year	u.m.	2013	2014	2015	2016	2017	2018	2019	2020
P_{iWPP}	[MW]	2800	2850	2900	3.100	3.400	4.100	4.700	5.000
Generation Park Evolution*	Commissioning	Full capacity operation of OMV PP	50 MW HPP	50 MW HPP	50 MW HPP + 150 MW Gas PP	50 MW HPP + 370 MW Gas PP	50 MW HPP + 370 MW Gas PP + 500MW HPS Tarnita	50 MW HPP + 500MW HPS Tarnita	50 MW HPP + 90 MW Gas PP



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Transelectrica Support for WPP integration



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- **Investment Plan with priority grid development**
- **Capacity allocation daily and intra-day - a new Balancing Platform was implemented**
- **Efforts to establish a regional energy market**
- **Future RES generation forecast department**





Transelectrica Support for WPP integration



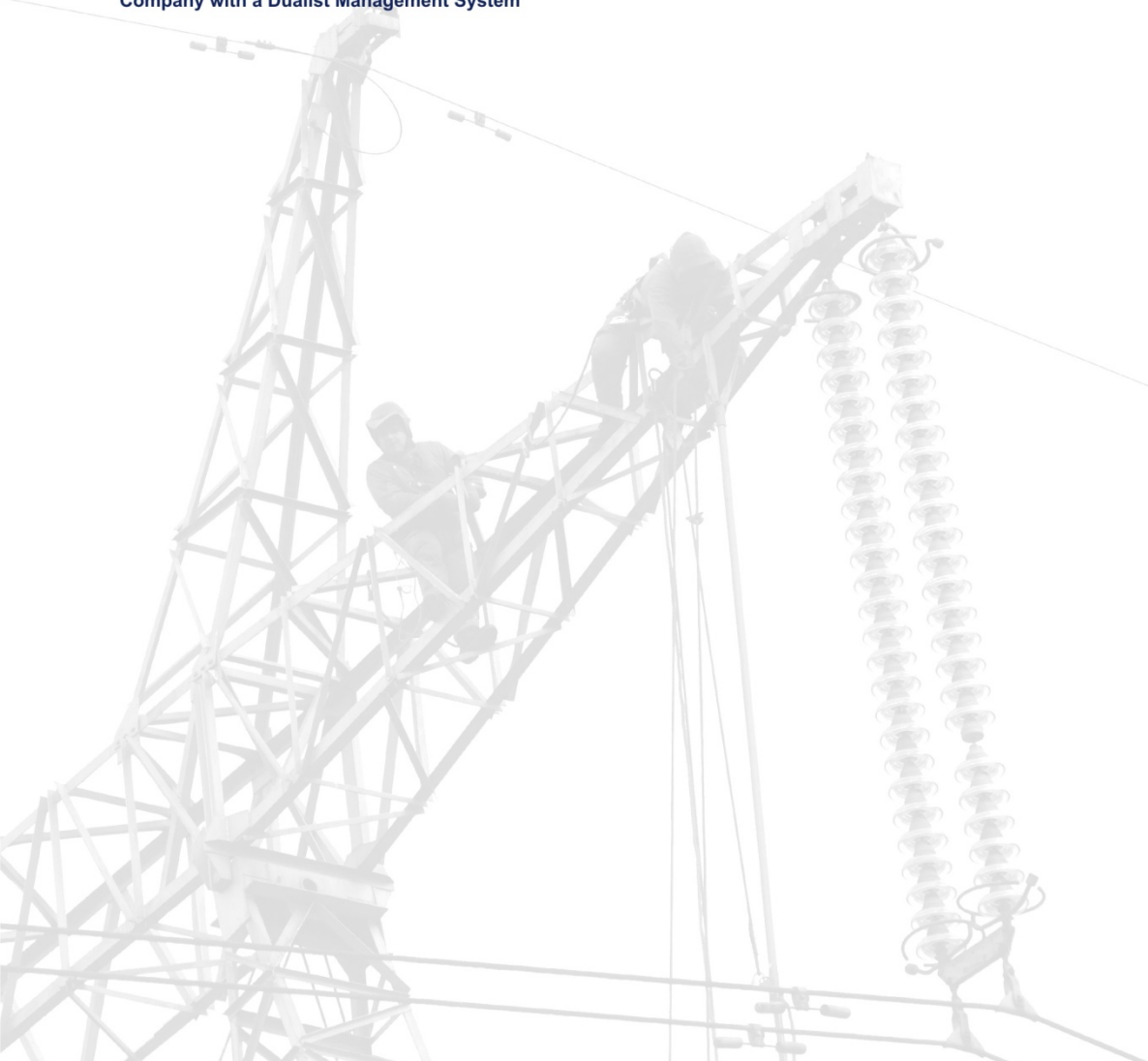
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Proposals

- Legal framework supporting correlation between installation of new RES capacity and Power System technical capability to accommodate it
- Legal framework to stimulate suppliers of system services (fast reserve) Hydro Pumped Storage and other storage facilities
- Support schemes for RES sustainable for consumers
- Framework for participation of RES investors in grid reinforcement, with/ without later costs recovery
- Enhancement of requirements for signing connection contracts



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THANK YOU!