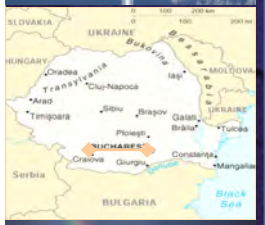
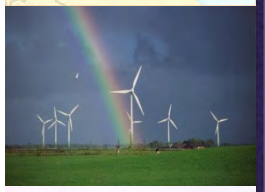







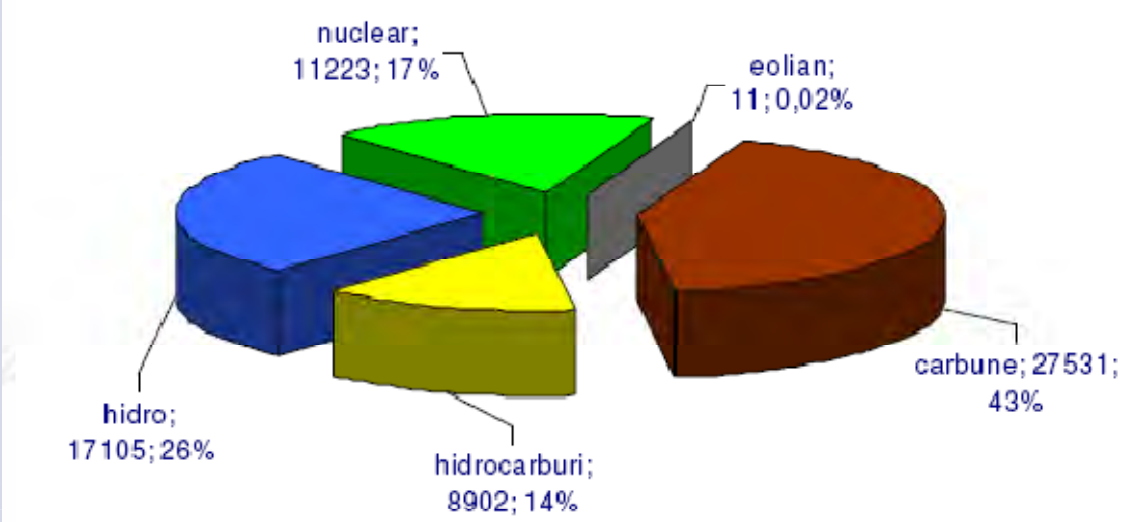
ROMANIAN WIND POWER RISING

Romanian Wind Energy Association
5th South East Europe Energy Dialogue
Thessaloniki 2011

CONTENT:

- 1. Romania's Current Power Breakdown
- 2. Renewable Energy Potential
- 3. National Targets-Wind energy's contribution
- 4. Wind energy projects to be commissioned during 2011-2013
- 5. Grid limitation
- 6. Promotional Mechanism
- 7. Lessons learned from EC state aid notification

Available gross power in 2010
17.693 MW



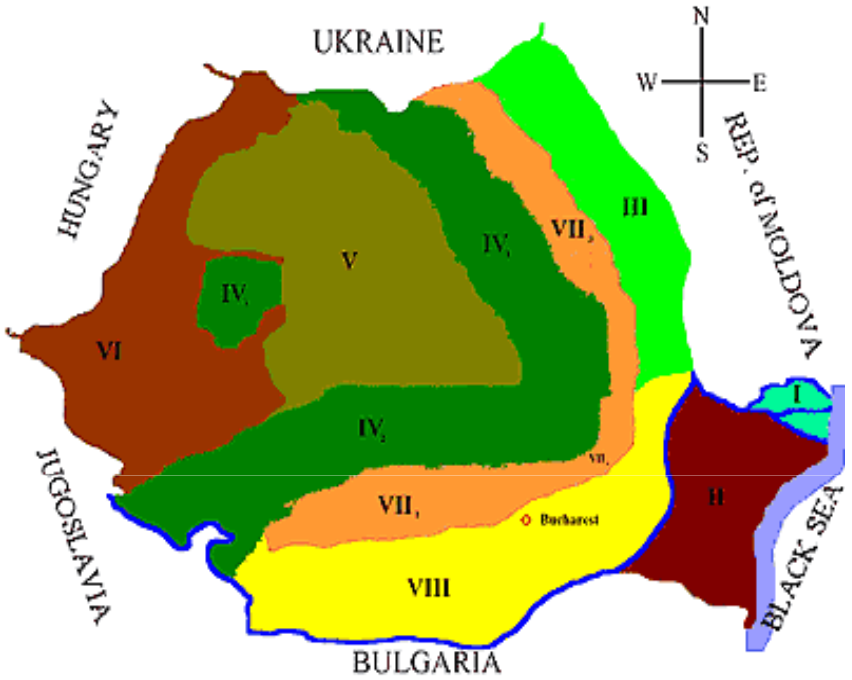
coal hydrocarbon fuels hydro nuclear wind

Fuel type	Structure of installed capacity (MW) by fuel type in Romania 2011
coal	7472
hydrocarbons	5110
hydro	6377
nuclear	1413
wind	550
total	20 922 MW

Romania's Renewable Energy Potential

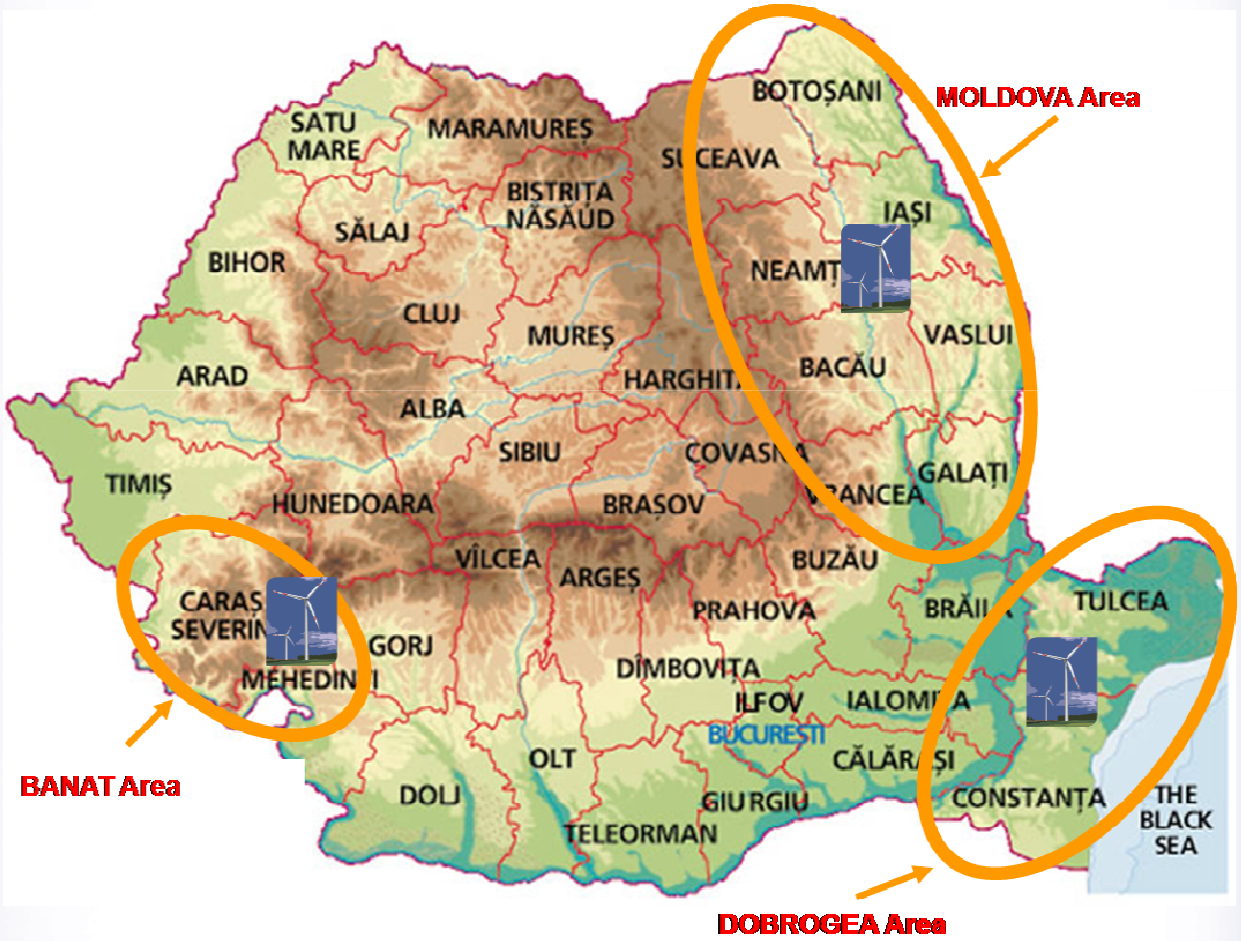
Sources	Yearly potential	Technology
Solar energy	60 PJ 1,2 TWh	Thermal energy Electricity
Wind energy (theoretic potential)	**23 TWh**	**Electricity**
Hydro of which with capacity <10MW	36 TWh 3,6 TWh	Electricity
Biomass and biogas	318 PJ	Thermal energy Electricity
Geothermal energy	7 PJ	Thermal energy

Romania's Renewable Energy Potential

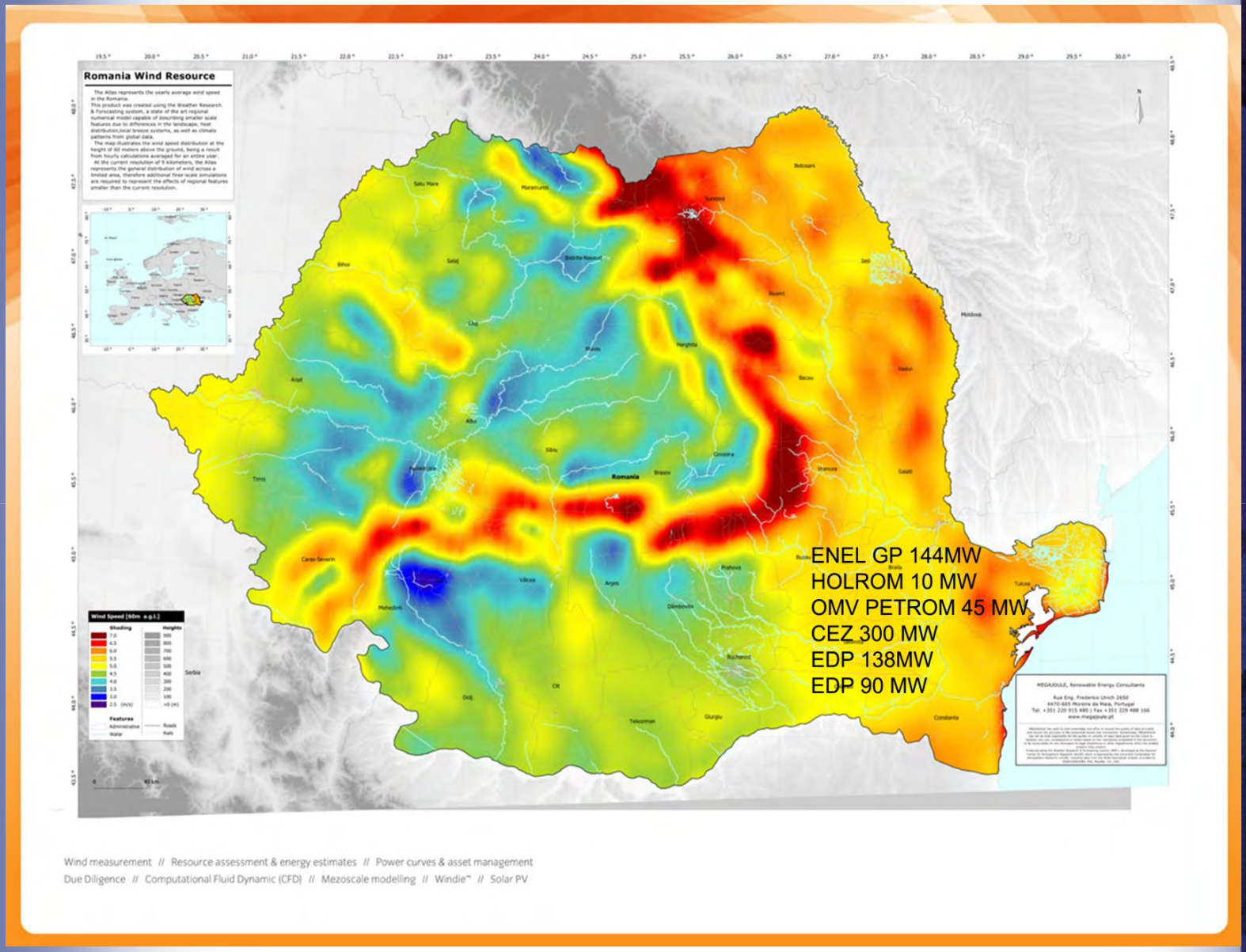


- I. Danube Delta (solar);
  II. Dobrogea (solar and wind);
  III. Moldova (microhydro, wind and biomass);
  IV. Carpaţi Moutain (IV1 – Carpaţii de Est; IV2 – Carpaţii de Sud;
  IV3 – Carpaţii de Vest (biomass, microhydro);
  V. Transilvania (microhydro);
  VI. Câmpia de Vest (geothermal);
  VII. Subcarpaţii(VII1 – Subcarpaţii Getici; VII2 – Subcarpaţii de Curbură; VII3 – Subcarpaţii Moldovei: biomass, microhydro);
  VIII. Câmpia de Sud (biomass, geothermal and solar).

Romania's Wind Energy Potential



Company	Location	MW installed per year				
		2009	2010	2011	2012	2013
Miscellaneous companies	Different localities-already running	14.1	3			
Holrom	Baia		5	5		
	Harsova				40	
	Tataru, Deleni and Fagarasu			8	16	
	Dulcesti				5	
Blue Planet	Baia					10
Global Wind Power	2 wind farms inCounty Galati			14		
	5 wind f. in Galati and Dobrogea			28		
Renovatio/ EDPR	Pestera		90			
	Cernavoda			138		
	Constanta county				26	
	Vutcani				24	
	Sarichioi				33	
	Galati county					100
	Galati county				30	
	Albesti			28		
Monsson	Silistea 2		5			
	Galbiori		5			
	Mireasa 2		10			
	Dobrogea area					200
	Silistea 1			25		
CEZ	Fantanele		300	47.5		
	Cogealac			50	202.5	
Bogaris	Harsova					72
	Facaieni					52
	Victoria					40
IMA PARTNERS+ Verbun	Casimcea, Topolog, Daieni				100	432
Land Power	Topolog				68	100
IMA Partners+Partners	7 localities from Vaslui North and Iasi South counties				132	510.5
Martifer	Babadag			42		
	Casimcea				40	
ENEL Green Power	Tulcea county		30	144		
	Constanta county				118	
EP Global Energy	Chirnogeni-Independenta					80
PNE WIND	Moldova+Dobrogea areas				100	100
Petrom	Dobrogea area			45		
Electricom	Dobrogea area			20		
IWE	Mitoc (Botosani county)					100
Iberdrola	Mihai Viteazu				80	
Alstom	Borsa (Bihor county)				56	
Karomex	Dobrogea area					50
TOTAL		**14.1**	**448**	**594.5**	**1070.5**	**1846.5**
Grand TOTAL		**3973.6**				



Wind measurement // Resource assessment & energy estimates // Power curves & asset management
Due Diligence // Computational Fluid Dynamic (CFD) // Mezoscale modelling // Windie™ // Solar PV

National Targets

Directive 2009/28/EC

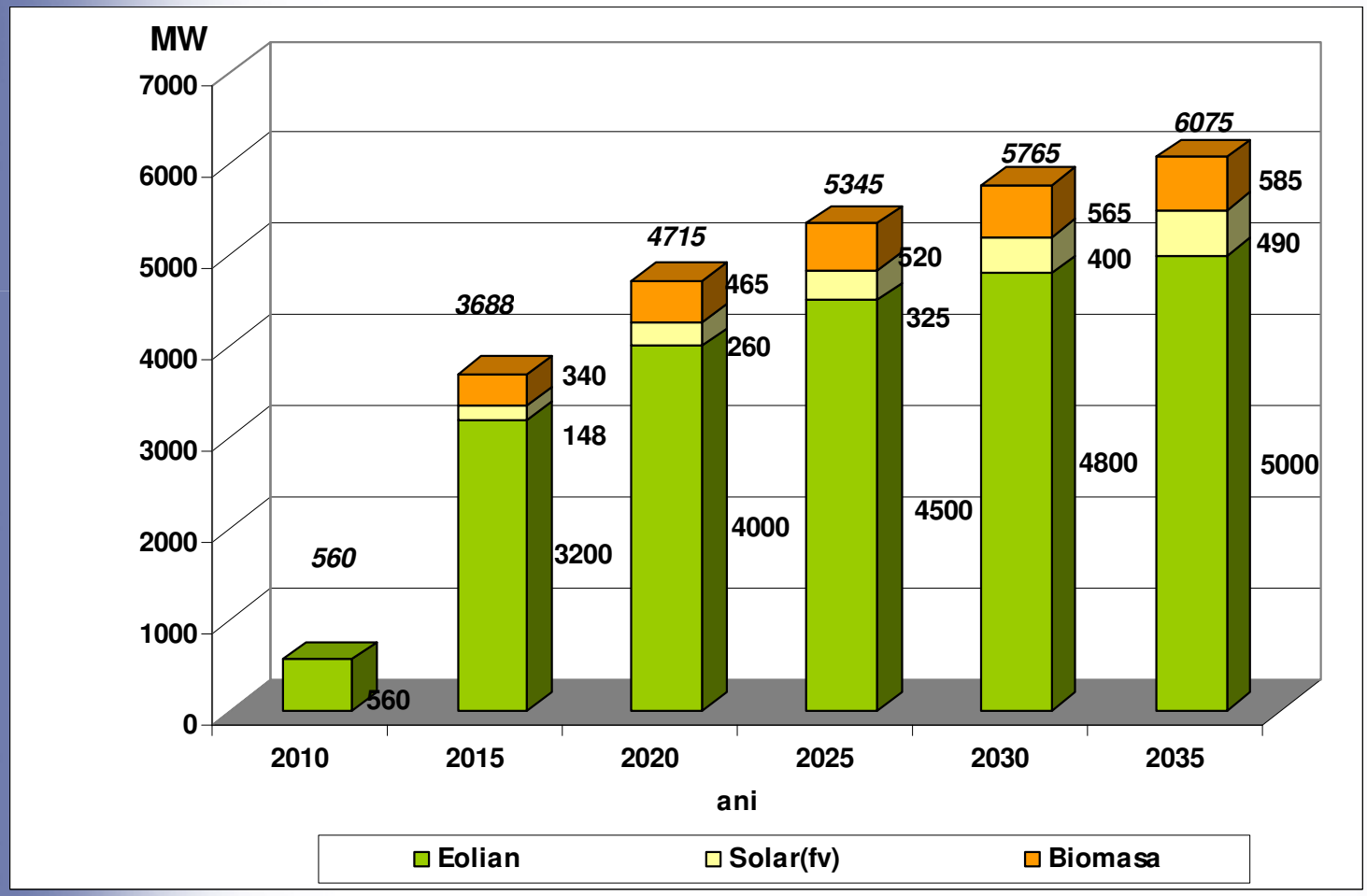
- ✓ 24 % of gross energy consumption in 2020 (+6.2 % from 2005

Romanian energy strategy 2007 – 2020:

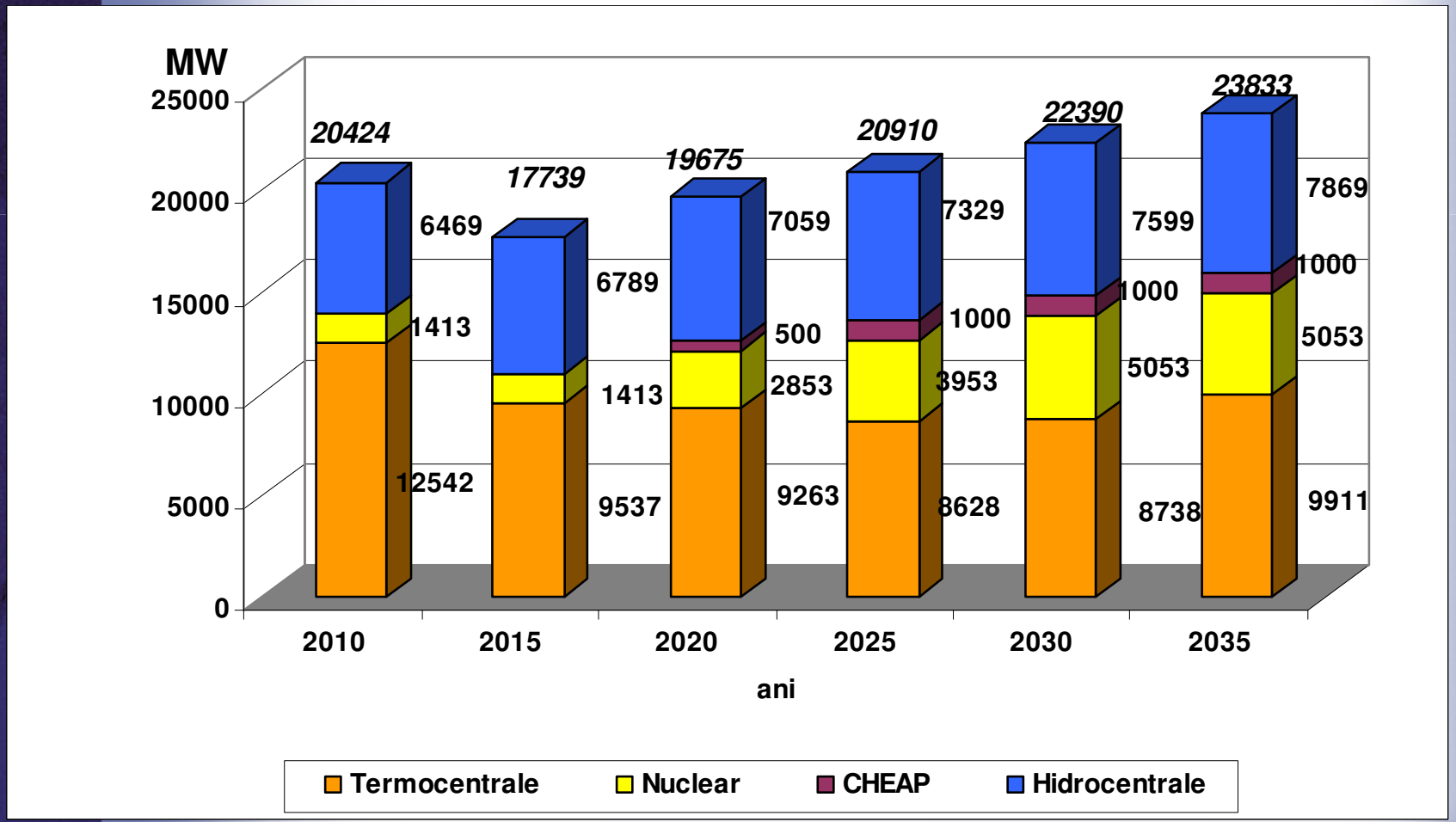
- ✓ 33 % of gross electricity consumption in 2010
- ✓ 35 % of gross electricity consumption in 2015
- ✓ 38 % of gross electricity consumption in 2020

New installed power – best structure renewables excluding hydro

Source: Revised Energy Strategy 2011-Ministry of Economy



New installed power – best structure classical including hydro



Barriers

- Legislative framework- promotional mechanism not fully enforced.
- Slow process in project financing from banks

  In 2011 BCR-ERSTE project-financed a 40 MW project Martifer and Unicredit Leasing financed 2 projects summing up 23 MW
- Grid: Maximum installed **wind power to be integrated into the grid** according to the calculations of the TSO Transelectrica in November 2009 is **4000 MW**. Calculations are based on 2007 available tertiary reserve.
- Heavy administrative procedures
- Lack of relevant wind measurements until 2008
- Land acquisition-problems due to the land fragmentation and lack of land register documents

LEGISLATION

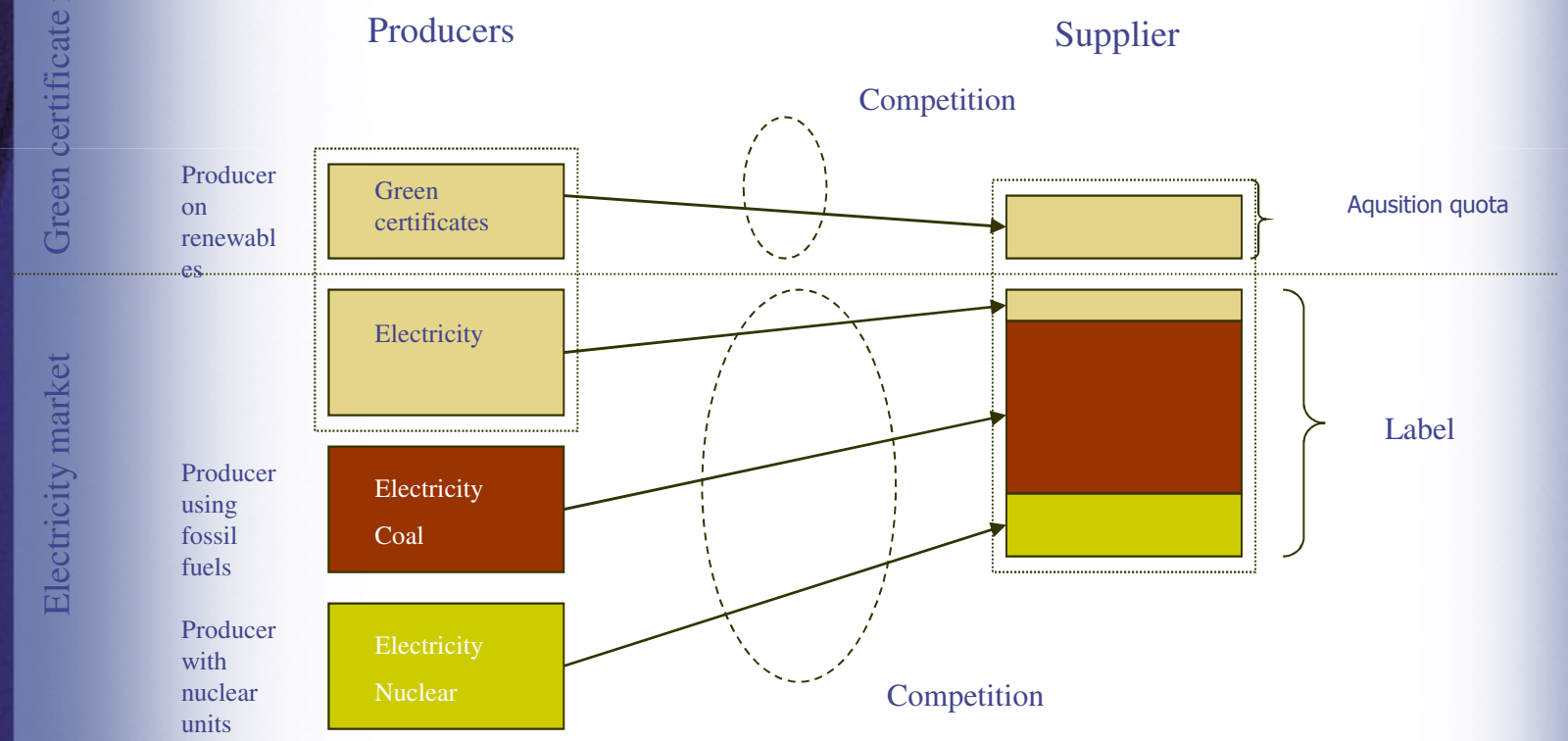
- The RES-E producers receive between 1 and 6 GC for each MWh generated from OTS, depending on the type of RES and electric power plant;
- The suppliers buy GC according to the duly established GC mandatory quota;
- GC are traded bilaterally or on a central market organized by S.C. OPCOM S.A. for values between 27 €/GC and 55 €/GC* (until 2025);
- The suppliers that do not produce the mandatory quota per annum pay the equivalent value of the GC not purchased for the amount of 110 € for each GC not purchased;
- The collected amounts constitute income to the Environment Fund in order to facilitate connecting RES-E power facilities of up to 100 kW, owned by natural entities, to the grid

Green Certificates

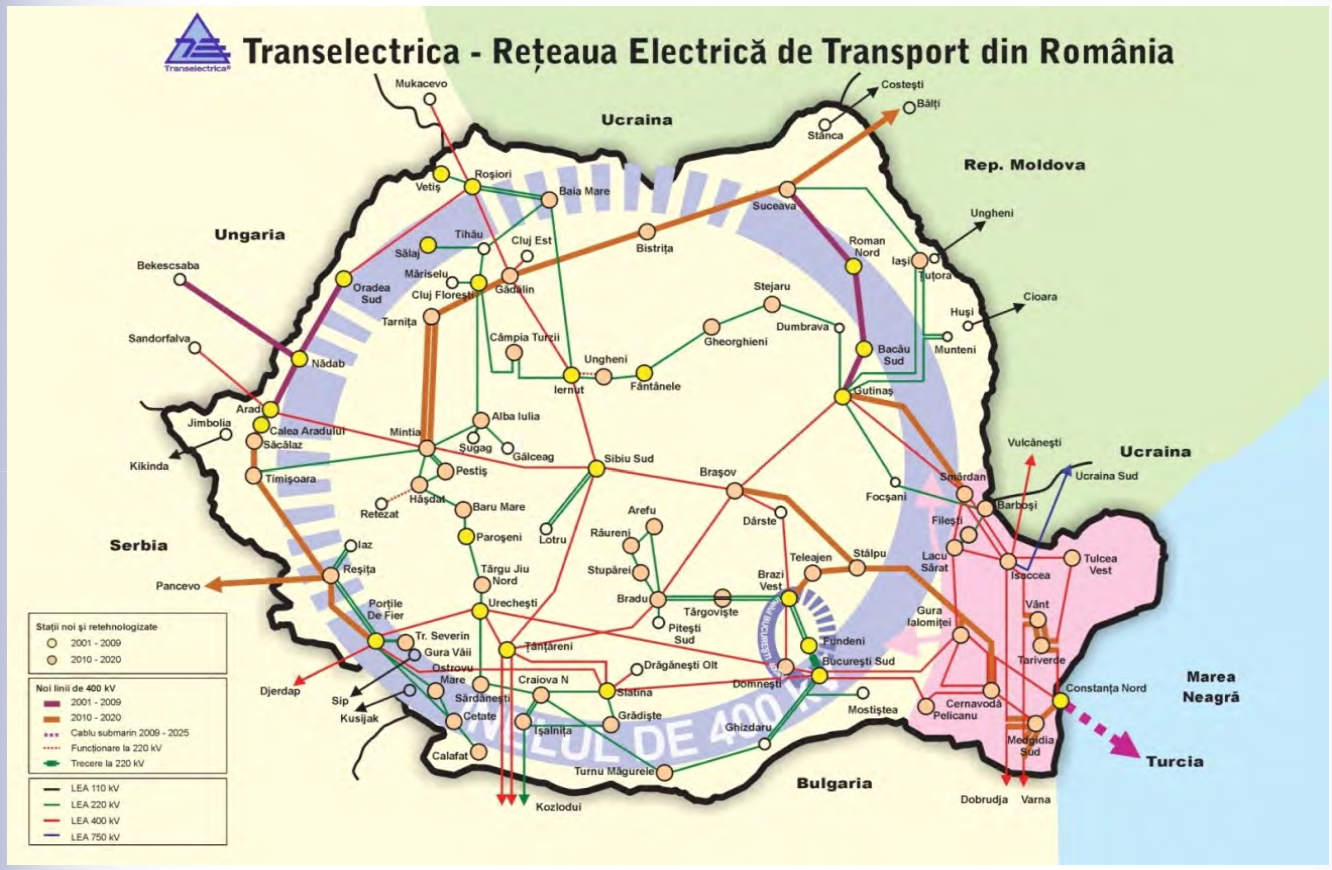
RES type	Type of electric unit / plant	Number of GC/MWh	Period (years)
1. Hydraulic energy – used in electric power plants with Pi ≤10 MW	new (commissioned after January 1st, 2004)	3 GC	15
	upgraded	2 GC	10
	commissioned by January 1st, 2004 and not upgraded	0.5 GC	3
2. Wind energy	new	2 GC by 2017	15
		1 GC as of 2018	
3. Biomass, biogas, bioliquids, geothermal energy, gas from waste processing, sludge fermentation gas in waste water treatment plants	new	3 GC	15
	highly efficient cogeneration (additionally over 3 GC)	1 GC	15
4. Solar energy	new	6 GC	15

Green certificate market

Promotion of renewable energy sources -Green certificates market



The Grid



To channel part of the new power abroad, Transelectrica plans an undersea electrical cable to link Romania to Turkey. This allows the country to export its excess electricity to Turkey. Stage: feasibility study.

6. Romania forecast for wind industry until 2020

- The quota for renewables shall be fulfilled
- 5500 MW to be installed in wind energy
- Increasing the back up for supporting this energy and interconnections
- Romania shall become a manufacturer of at least for a part of components of wind generators

Lessons learned from EC -DG COMP

- 125 MW notified individually
- Overcompensation principle for wind 10.9%-13.8% IRR

7-8 September Conference and Exhibition in Constanta
ROMANIAN WIND ENERGY FORUM

Thank you for your attention!

ROMANIAN WIND ENERGY ASSOCIATION

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