



The Energy Sector in Romania. Present and Future

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Romanian Electricity Sector



Romanian electricity sector



Transelectrica - Rețeaua Electrică de Transport din România



=== Starea sistemului ===
 Consumul și producția în România
 Ultima actualizare:
 28-02-2010 ora 16:21:51

Prognoza	0 MW
Consum	5921 MW
Producție	5839 MW
- carbune	2242 MW
- hidrocarburi	1237 MW
- hidro	1649 MW
- nuclear	710 MW
Sold schimb	82 MW

(-) export/ (+) import

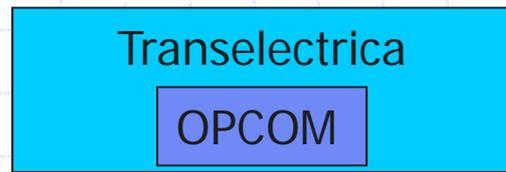
Stații noi și re tehnologizate	
○	2001 - 2009
○	2010 - 2020
Noi linii de 400 kV	
—	2001 - 2009
—	2010 - 2020
---	Cablu submarin 2009 - 2025
---	Funcționare la 220 kV
—	Trecere la 220 kV
LEA	
—	LEA 110 kV
—	LEA 220 kV
—	LEA 400 kV
—	LEA 750 kV

Overhead transmission lines: 8800 km Transmission substations: 76
 Distribution lines: 310127 km Distribution substations: 1296
 National consumption: 54.6 TWh (2008), 49.9 TWh (2009), 53.4 TWh (2010)



Romanian electricity sector

Electricity sector structure



Transmission and system operator
Commercial operator



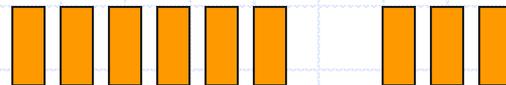
8 distribution companies (DISCOs)



Producer with hydro power plants



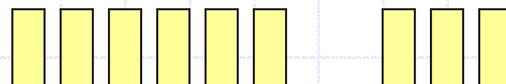
Producers with thermal power plants



Almost 20 municipal cogen producers



Producer with nuclear power plant



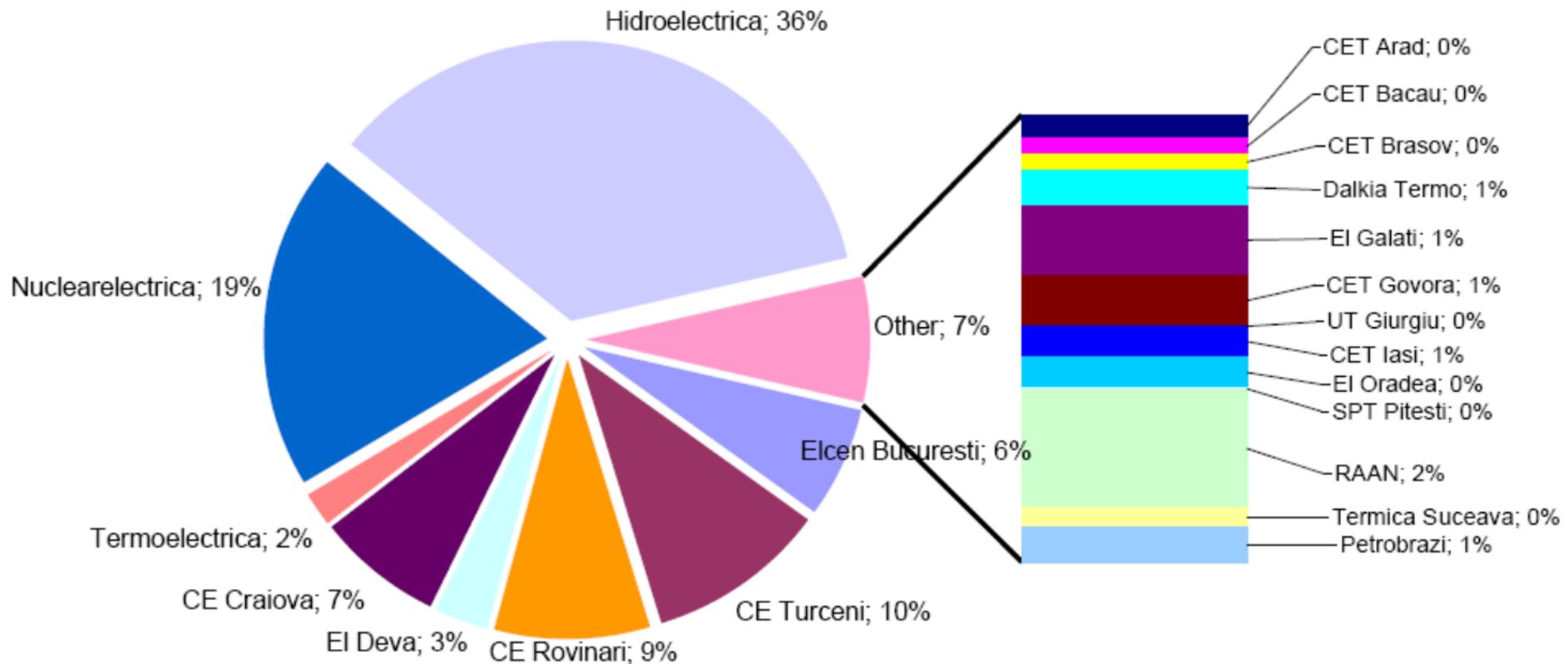
More than 170 independent suppliers



Romanian electricity sector

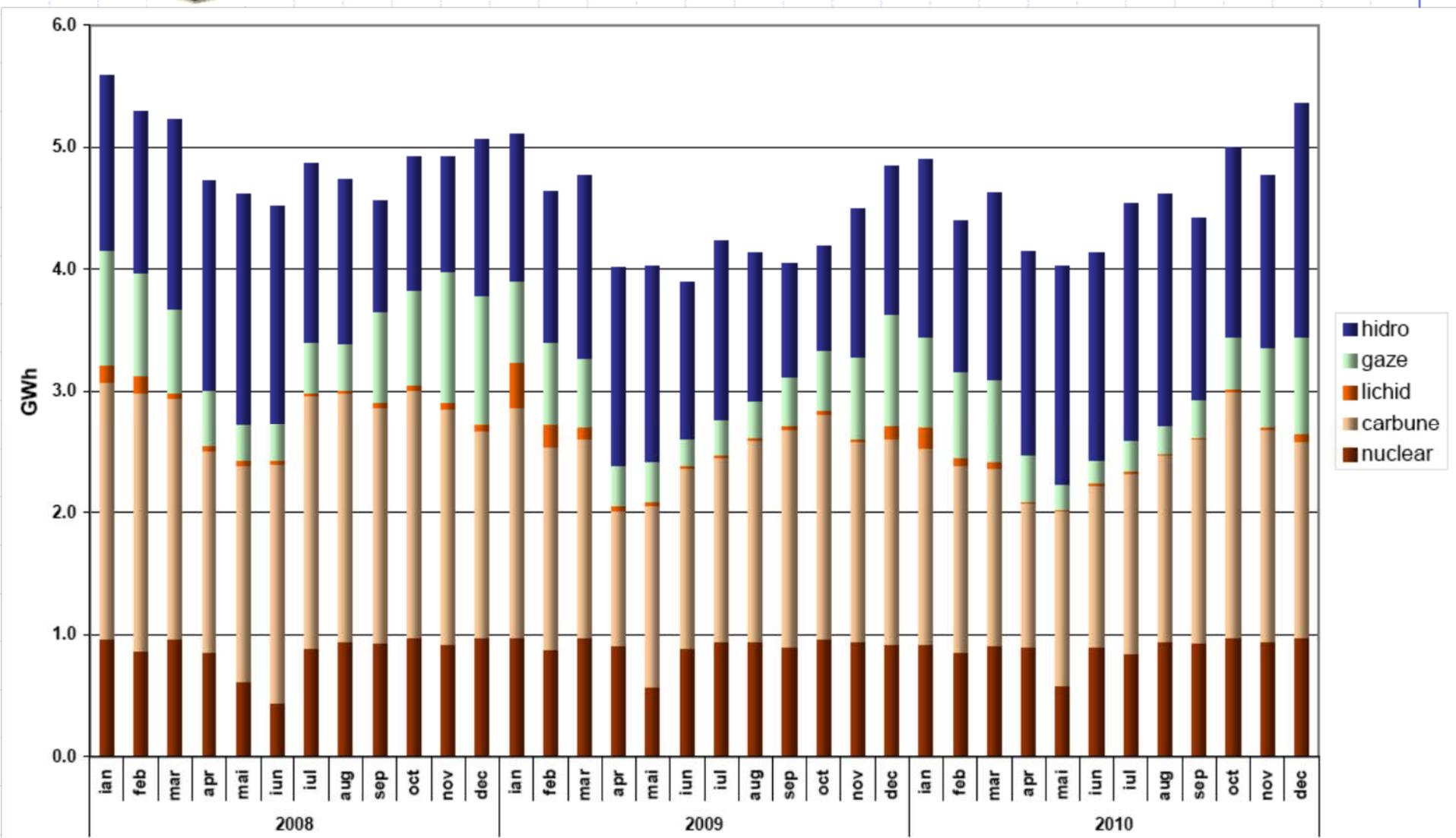
Electricity generation structure

C1 - 36%
C3 - 65%
HHI - 1947





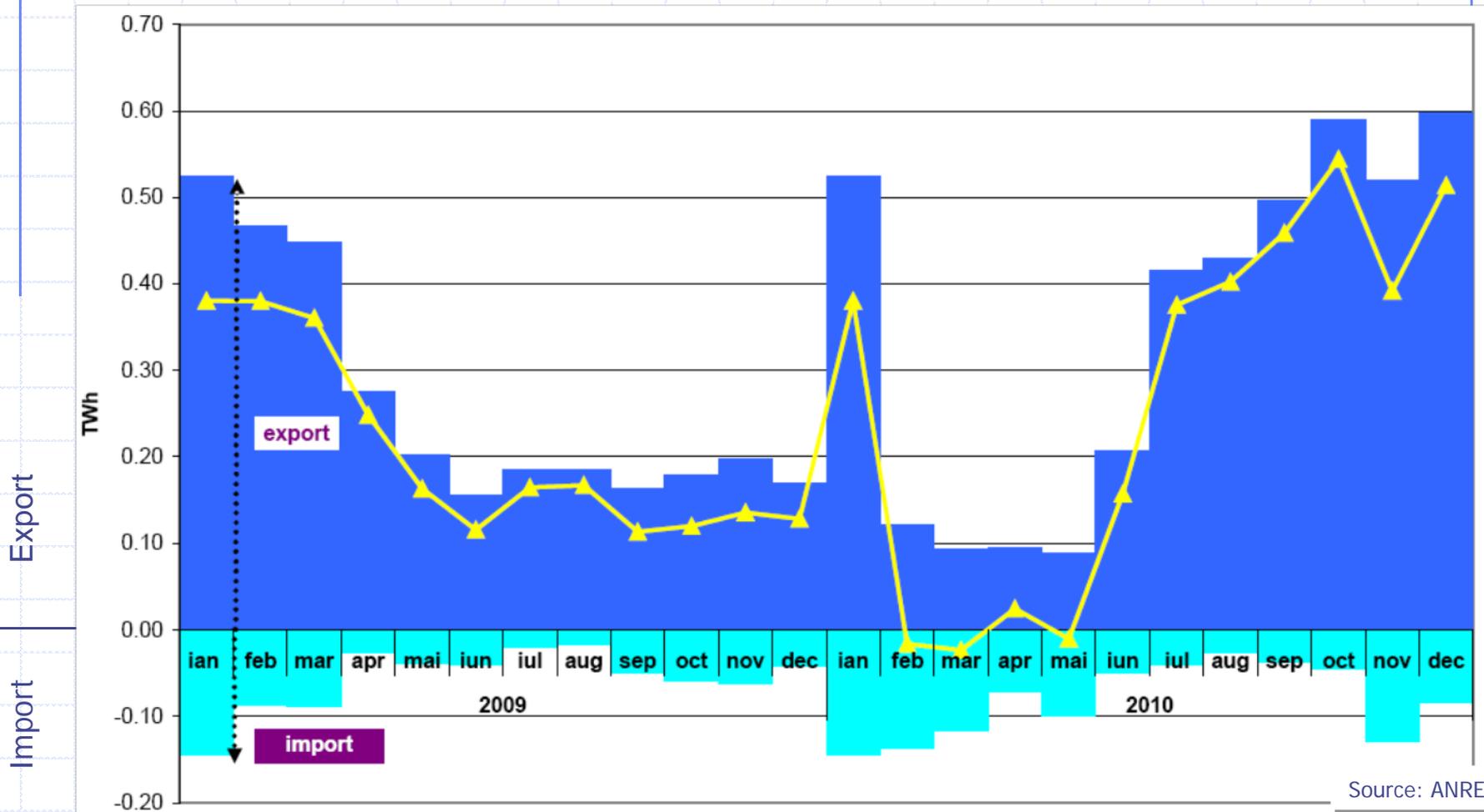
Romanian electricity sector





Romanian electricity sector

Electricity export / import balance





Romanian Electricity Market



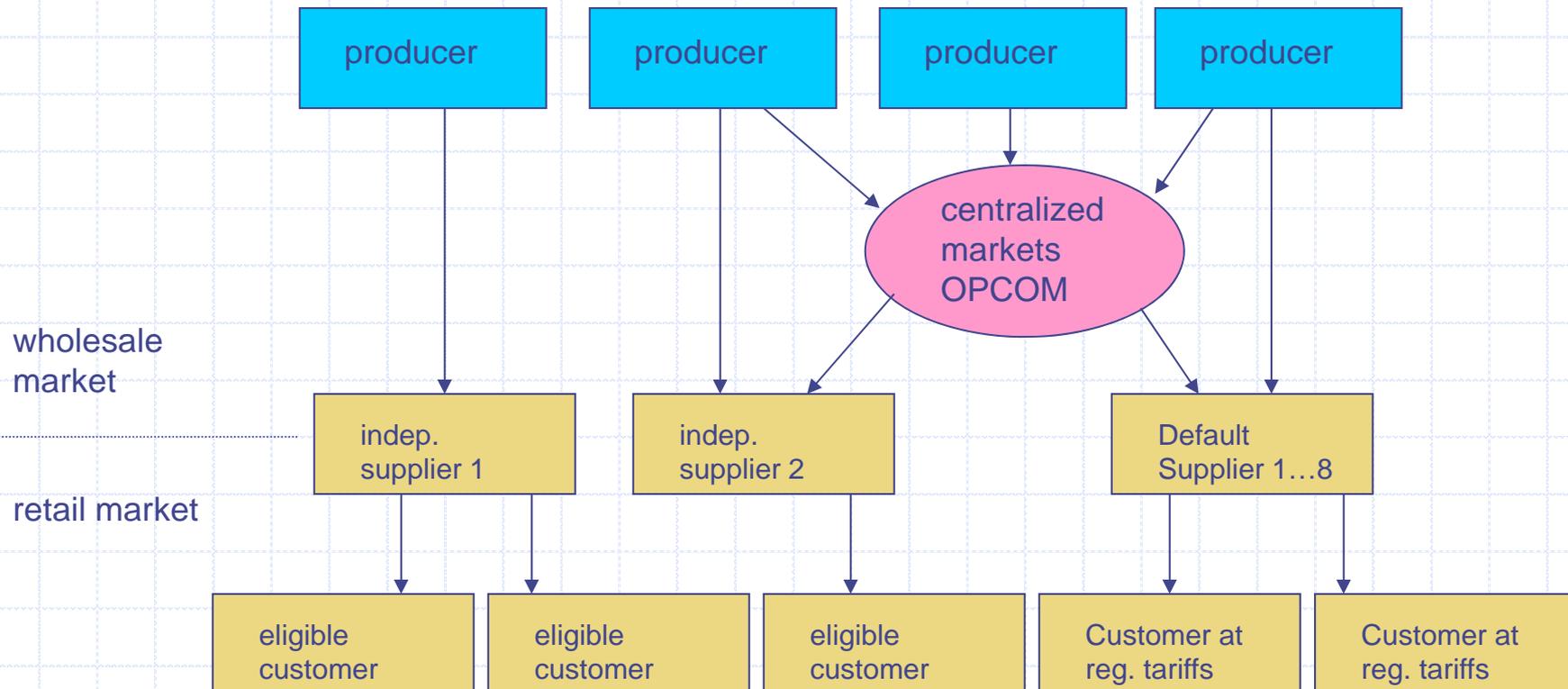
Romanian electricity market

- ✓ Fully liberalized from July 2007;
- ✓ No administrative barriers for imports and exports of energy or energy resources;
- ✓ Advanced electricity market compared with other countries in the region;
- ✓ Market operator – **Opcom** operating:
 - ✓ Day Ahead Market
 - ✓ Forward market;
 - ✓ Green Certificates Market
 - ✓ CO₂ Allowances market
 - ✓ Market settlement.
- ✓ Balancing Market operated by the TSO, Transelectrica



Romanian electricity market

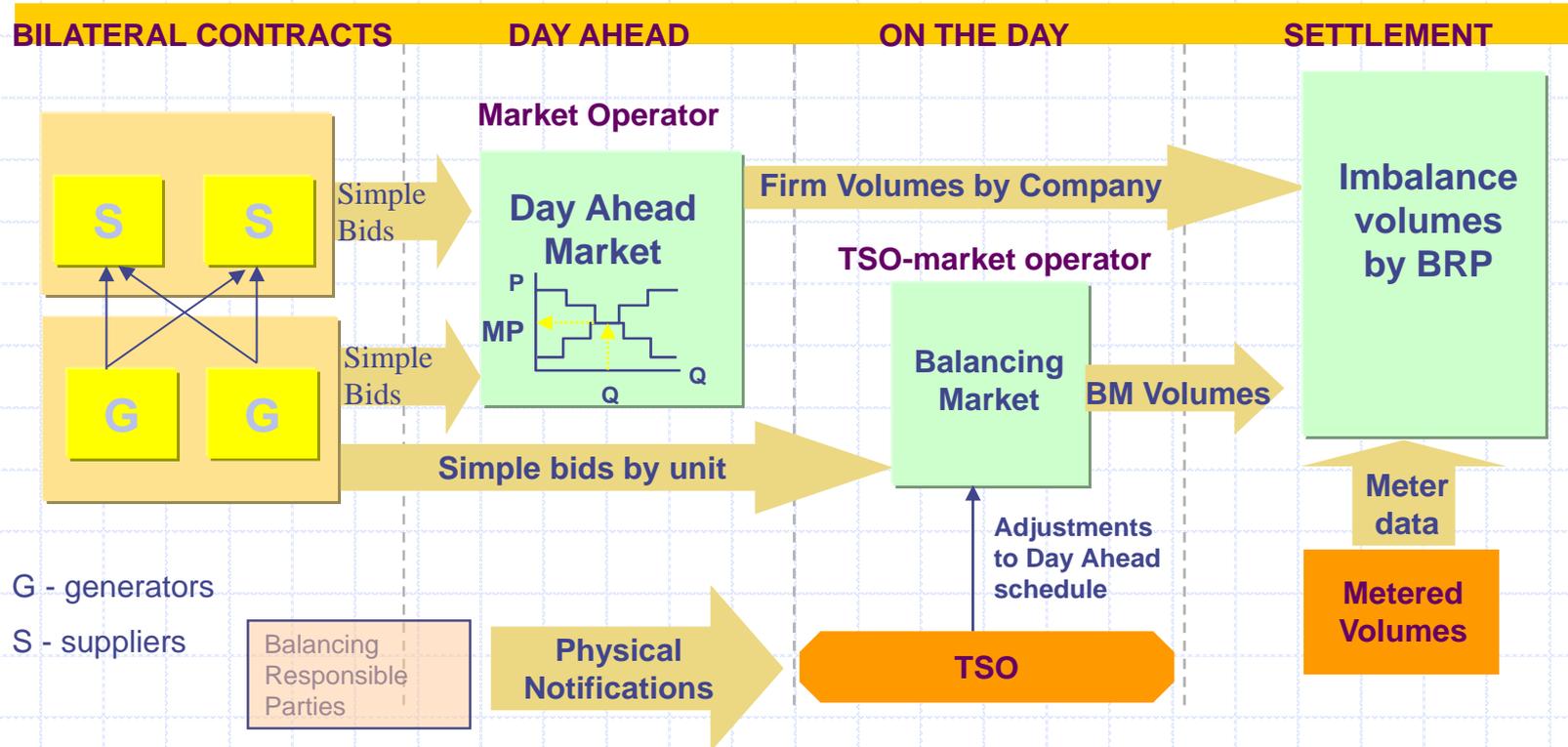
Wholesale vs. retail electricity market





Romanian electricity market

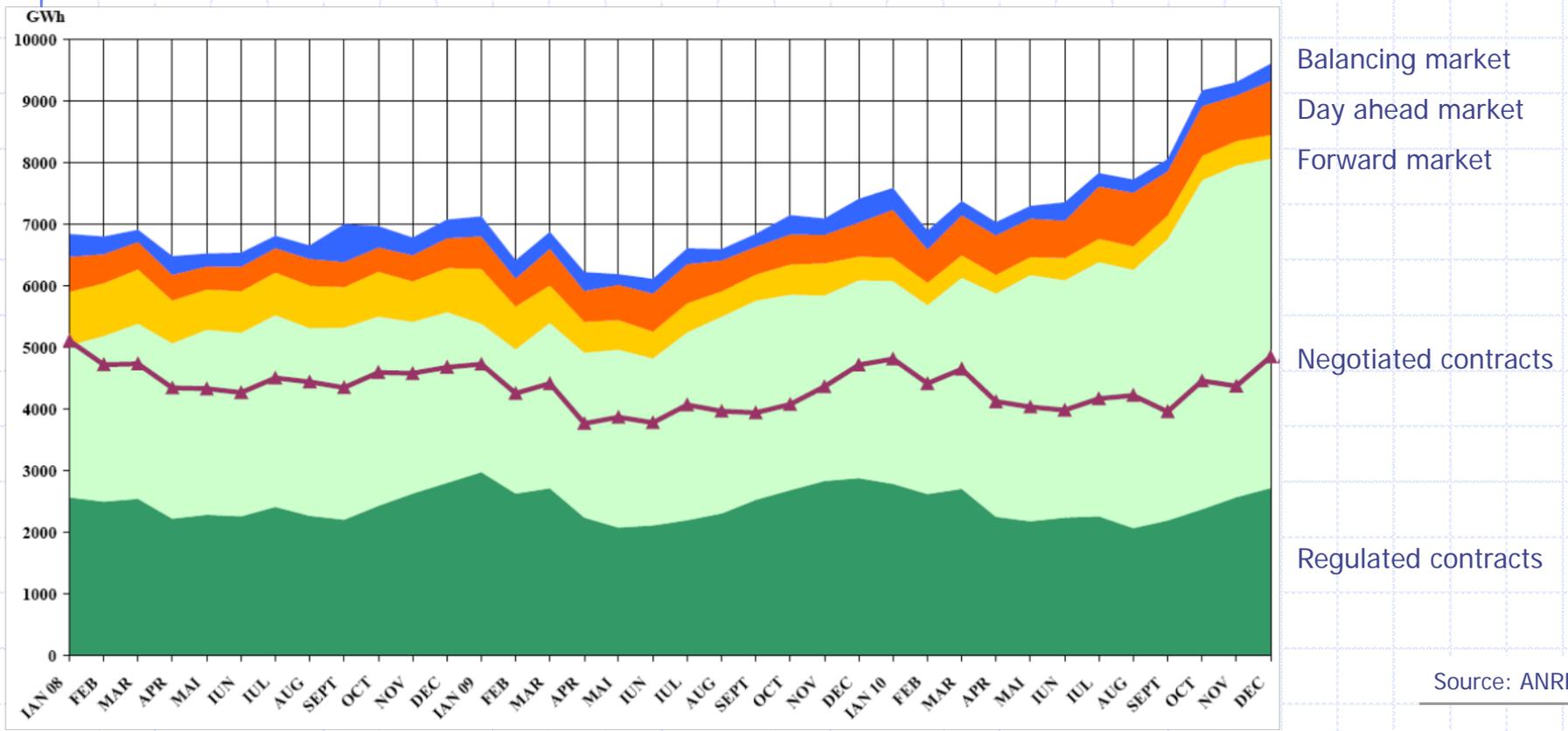
Wholesale electricity market





Romanian electricity market

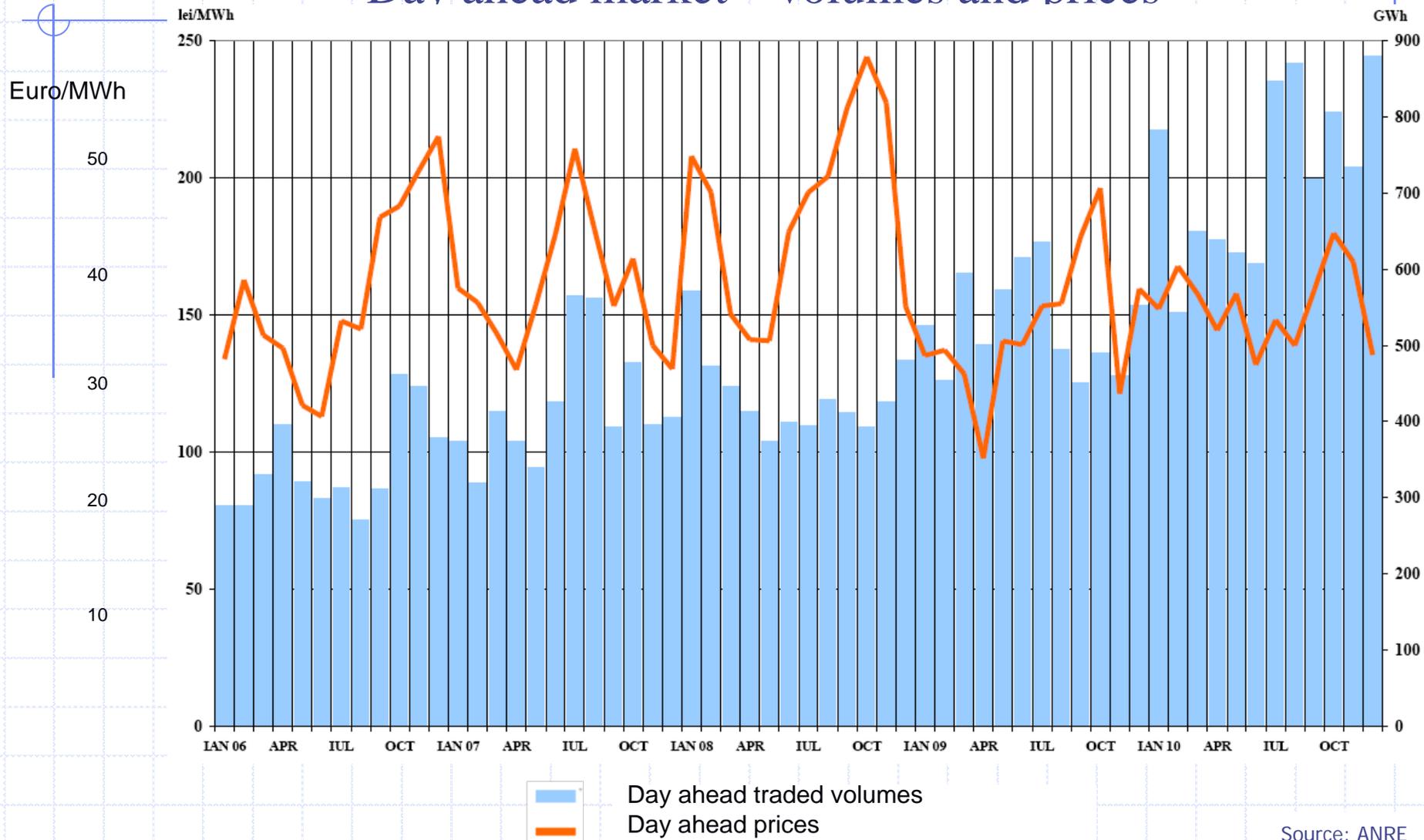
Wholesale electricity market – monthly traded volumes





Romanian electricity market

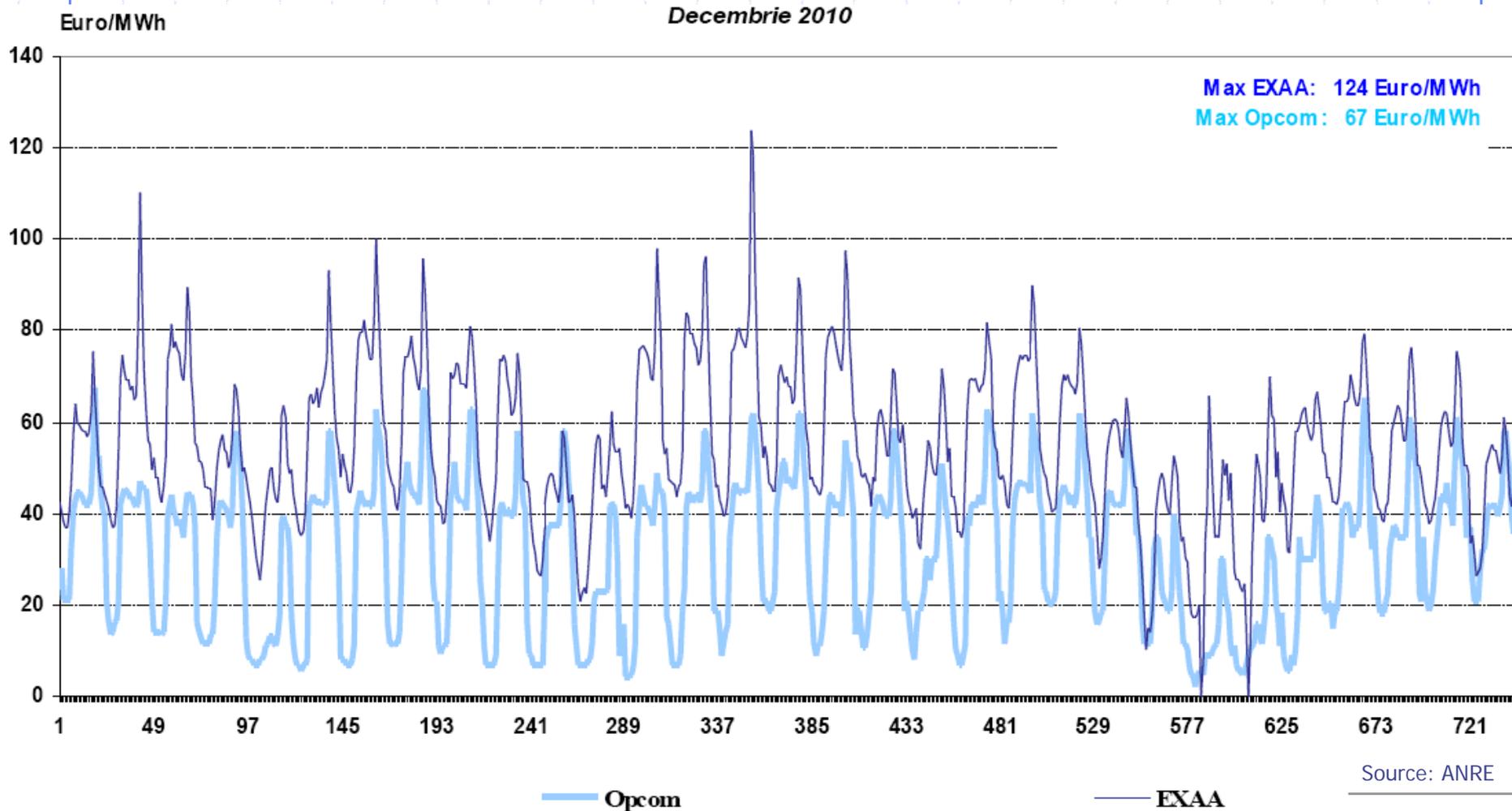
Day ahead market – volumes and prices





Romanian electricity market

Day ahead market – comparing to other markets





Romanian electricity market

Future developments

- ✓ Adjusting market
- ✓ Intra-day markets

Both are in testing phase

Market coupling discussions with neighboring countries

Financial products market (futures, options) to be organized in cooperation by:

- ✓ Opcom - energy market operator and
- ✓ BVB – Bucharest Stock Exchange



Romanian Energy Strategy



Romanian energy strategy 2007 – 2020

Issued in November 2007 through GD 1069/2007

Consultation and agreement of all parliamentary parties

In line with EU Policy document in energy (January 2007)

Based on a Least Cost Development Study

Currently under revision



Romanian energy sources potential

The national fossil fuel reserves

Source	Reserves						Estimated annual production	Forecasted depletion		
	Geological reserves		Concessioned areas		New areas			Geological reserves	Concessioned areas	New areas
	Mil. ton 1)	Mil. tep	Mil. ton 1)	Mil. tep		Mil. tep	Mil. ton ¹⁾	years	years	years
1	2	3	4	5	6	7	8	9 = 2 / 8	10 = 4 / 8	11 = 6 / 8
Coal										
hard coal	755	422	105	38,8			3.3	229		32
lignite	1490	276	445	82,4	1045	133	32	47	14	33
Oil	74	72					5,2	14		
Natural gas	185	159					12,5	15		
Uranium ²⁾										

¹⁾ excluding natural gas expressed in mld. Mc

²⁾ data not public



Romanian energy sources potential

The national renewable energy sources potential

Source	Annual potential	To be used for:
Solar	60 PJ/an 1,2 TWh	Heat Electricity
Wind	23 TWh	Electricity
Hydro of which under 10 MW	36 TWh 3,6 TWh	Electricity
Biomass and biogas	318 PJ	Heat Electricity
Geothermal	7 PJ	Heat

NOTE : these are theoretical potentials, real usable potentials are much lower due to technological, economical and environmental limitations or restrictions.



Challenges facing the energy sector

- The environmental impact of using primary energy sources and of energy conversion technologies, especially the CO₂ emissions;
- The finite world reserves of fossil fuels;
- The increase dependency on imports of primary energy sources;
- The increase in energy demand.



Romanian energy strategy 2007 – 2020

Answers to challenges

Reducing CO₂ emissions by:

- ✓ promoting renewable energy sources
 - electricity targets of 33 % in total gross electricity consumption of 2010, 35 % in 2015 and 38 % in 2020
- ✓ promoting nuclear energy
 - unit 2 Cernavoda of 600 MW commissioned in 2007
 - unit 3 and 4 to be completed by a consortium
 - New NPP to be build



Romanian energy strategy 2007 – 2020

Answers to challenges

Reducing energy dependency on imported fossil fuels by using a balanced energy mix and by:

- ✓ promoting renewable energy sources;
- ✓ promoting the use of indigenous coal, but using *clean coal technologies*, preferable with *carbon capture and storage* facilities;
- ✓ promoting nuclear energy (Romania still have natural uranium resources).



Romanian energy strategy 2007 – 2020

Answers to challenges

Diversifying energy supply sources and routes by:

- ✓ promoting the Nabucco Project on natural gas;
- ✓ promoting the AGRI project;
- ✓ promoting the PEOP Project on oil;
- ✓ studying the feasibility of a LNG / LPG terminal in Constantza harbor;
- ✓ increasing the interconnection capacity on natural gas with Hungary and Bulgaria;
- ✓ increasing the interconnection capacity on electricity with Moldova, Serbia, Hungary and Turkey (submarine cable).



Romanian energy strategy 2007 – 2020

Answers to challenges

Increasing energy sources storage capacity by:

- ✓ increasing the gas storage capacity from 2550 mil. CM in 2007 to 3935 mil. CM in 2012;
- ✓ increasing the oil storage capacity to fulfill 67.5 days of consumption in 2011;
- ✓ construction of a 1000 MW pump – storage hydropower plant (mainly for daily, short term security of supply).



Romanian energy strategy 2007 – 2020

Answers to challenges

Limiting energy consumption increase by energy efficiency measures:

- ✓ energy audits are mandatory for big industrial consumers;
- ✓ National Plan for Energy Efficiency was drafted in 2007;
- ✓ National programme for building insulation;
- ✓ Structural Funds to be used for energy efficiency projects.

On an estimated 6 % yearly GDP increase, we expected a 3 % yearly energy consumption increase.



Revised Energy Strategy

Why to revise the National Energy Strategy?

- revised prognosis of economic growth and energy consumption;
- new EU legislative packages;
- new political decisions regarding the state owned energy companies.

Time horizon: 2011 – 2035

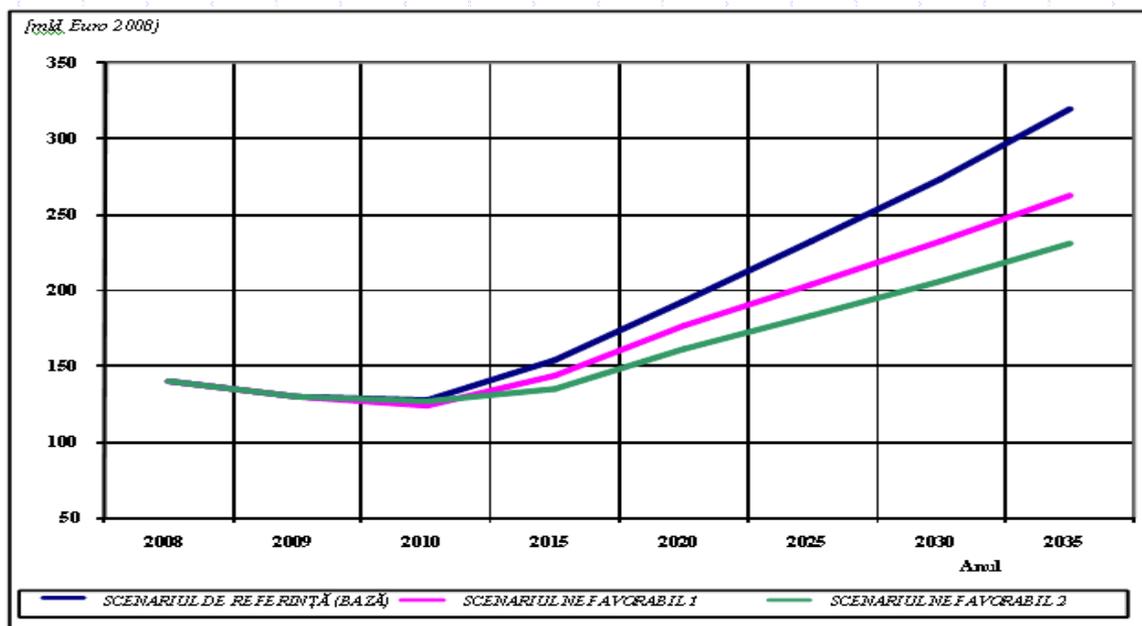
Main consultant: ISPE

Discussion document to be published in January 2011



Revised Energy Strategy

Macroeconomic development – GDP forecast

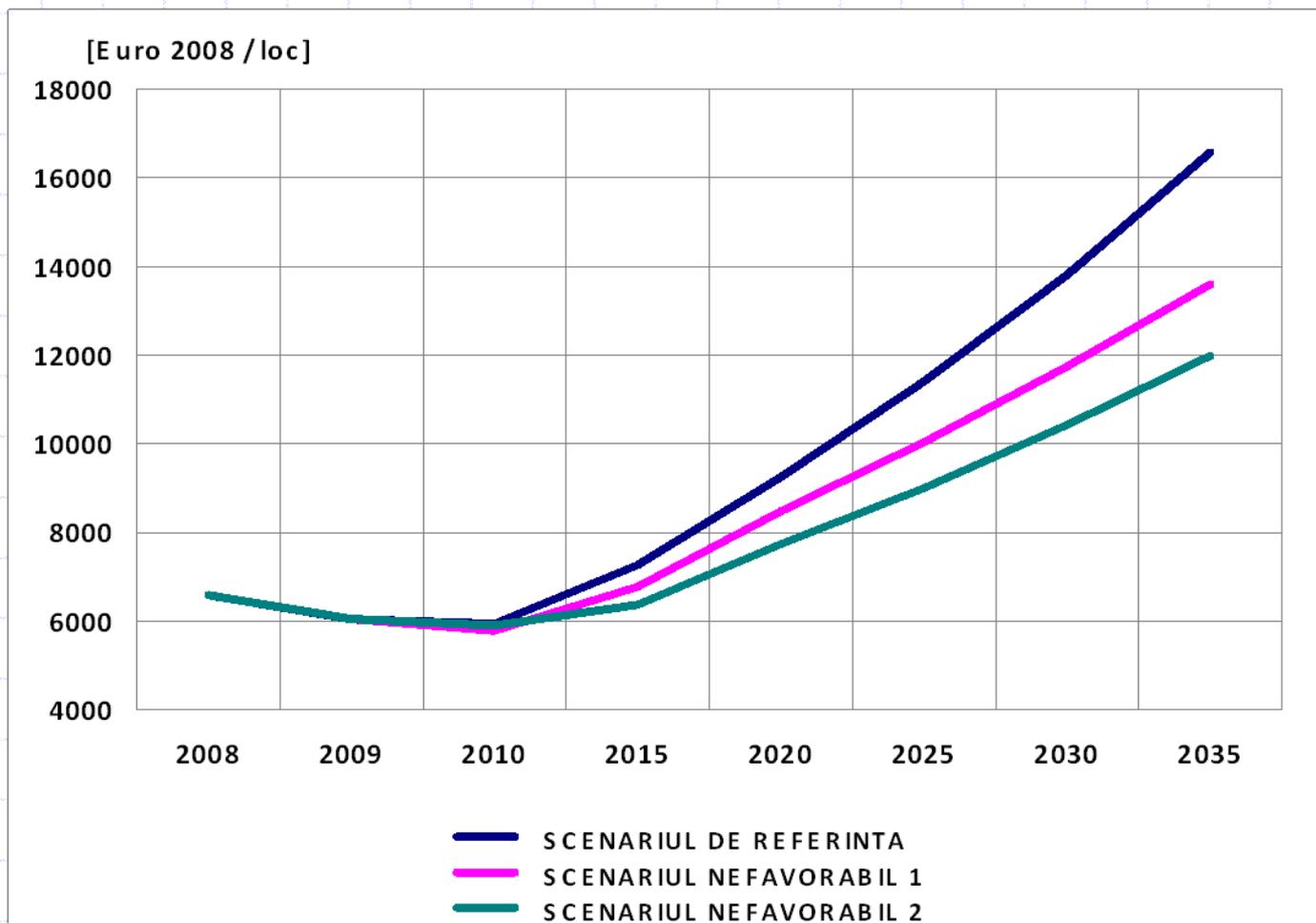


	2009	2010	2011	2012	2013	2014	2014-2020	2020-2025	2025-2030	2030-2035
Reference scenario	-7,10	-1,90	1,50	3,90	4,50	4,70	4,60	3,80	3,30	3,20
Unfavorable scenario 1	-7,10	-4,43	-3,56	0,75	2,35	3,93	4,20	2,94	2,61	2,46
Unfavorable scenario 2	-7,10	-2,60	-0,38	1,66	1,46	0,16	3,60	2,58	2,40	2,31



Revised Energy Strategy

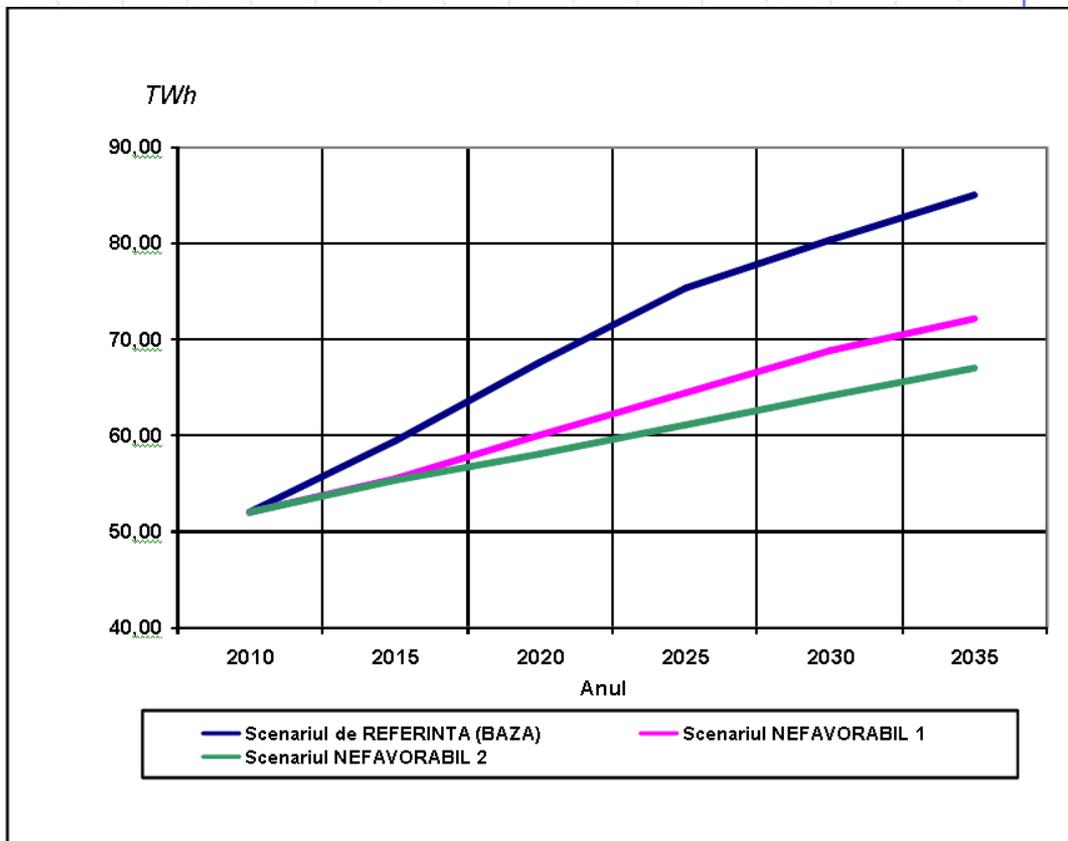
Macroeconomic development – GDP per capita forecast





Revised Energy Strategy

National electricity consumption forecast



Yearly energy consumption increase [%]

	2009	2010	2011	2012	2013	2014	2015	2015 - 2020	2020 - 2025	2025 - 2030	2030 - 2035
Reference scenario	-7,97	2,36	2,70	2,70	2,70	2,70	2,70	2,60	2,20	1,30	1,14
Unfavorable scenario 1	-7,97	2,36	1,31	1,31	1,31	1,31	1,31	1,57	1,46	1,30	0,97
Unfavorable scenario 2	-7,97	2,36	1,28	1,28	1,28	1,28	1,07	0,99	1,01	0,99	0,86



Revised Energy Strategy

Installed power balance

- Installed power 2010 – 20437 MW
- Net available power 2010 – 16445 MW
- To be withdraw till 2020 – 5544 MW (28 %)
- To be withdraw till 2035 – 11066 MW (55 %)

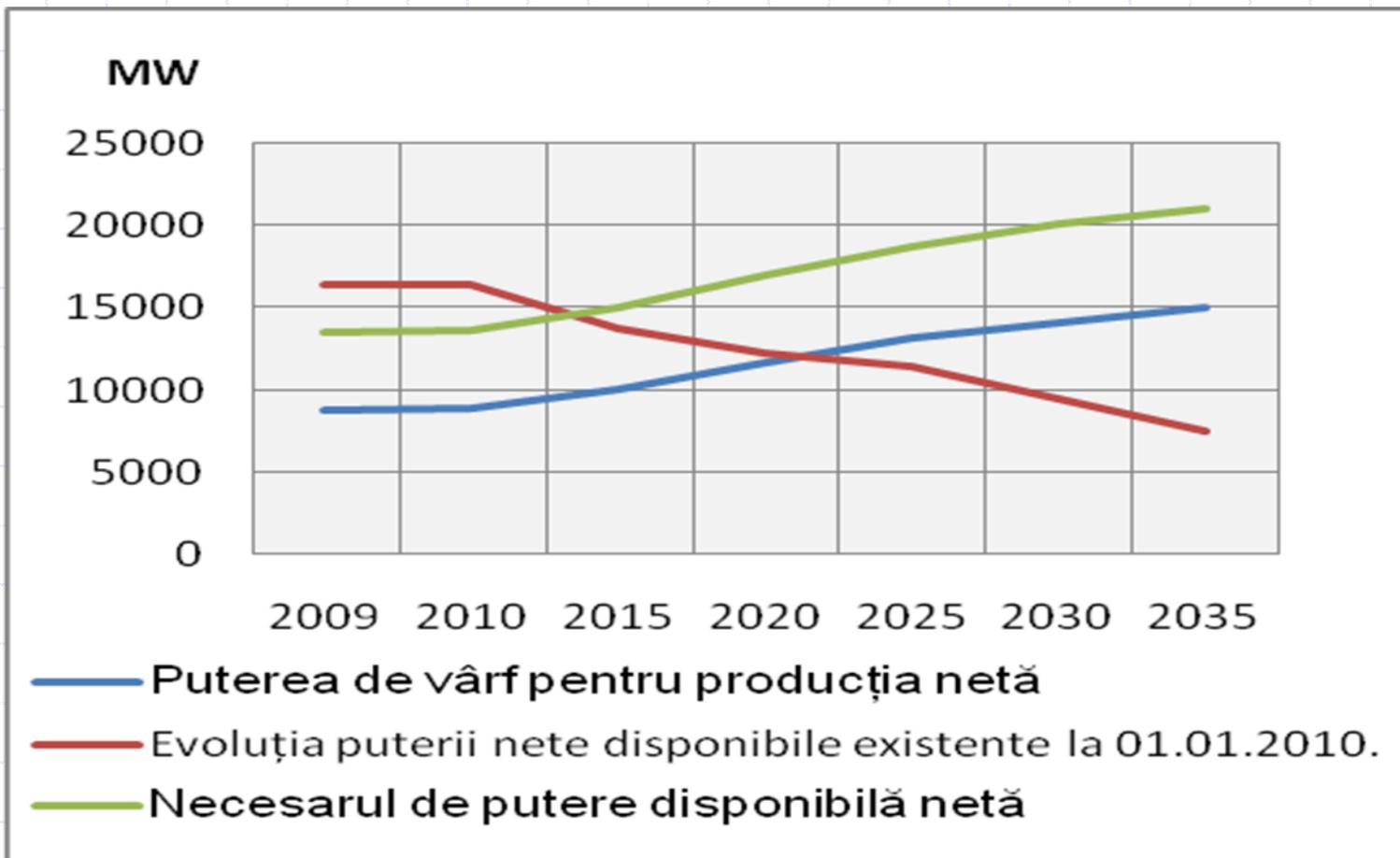
Withdraws [MW]

	2010- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	Total 2010-2035
Installed power	3820	1724	1075	2190	2287	11066
Net available power	2641	1511	859	1935	1953	8899



Revised Energy Strategy

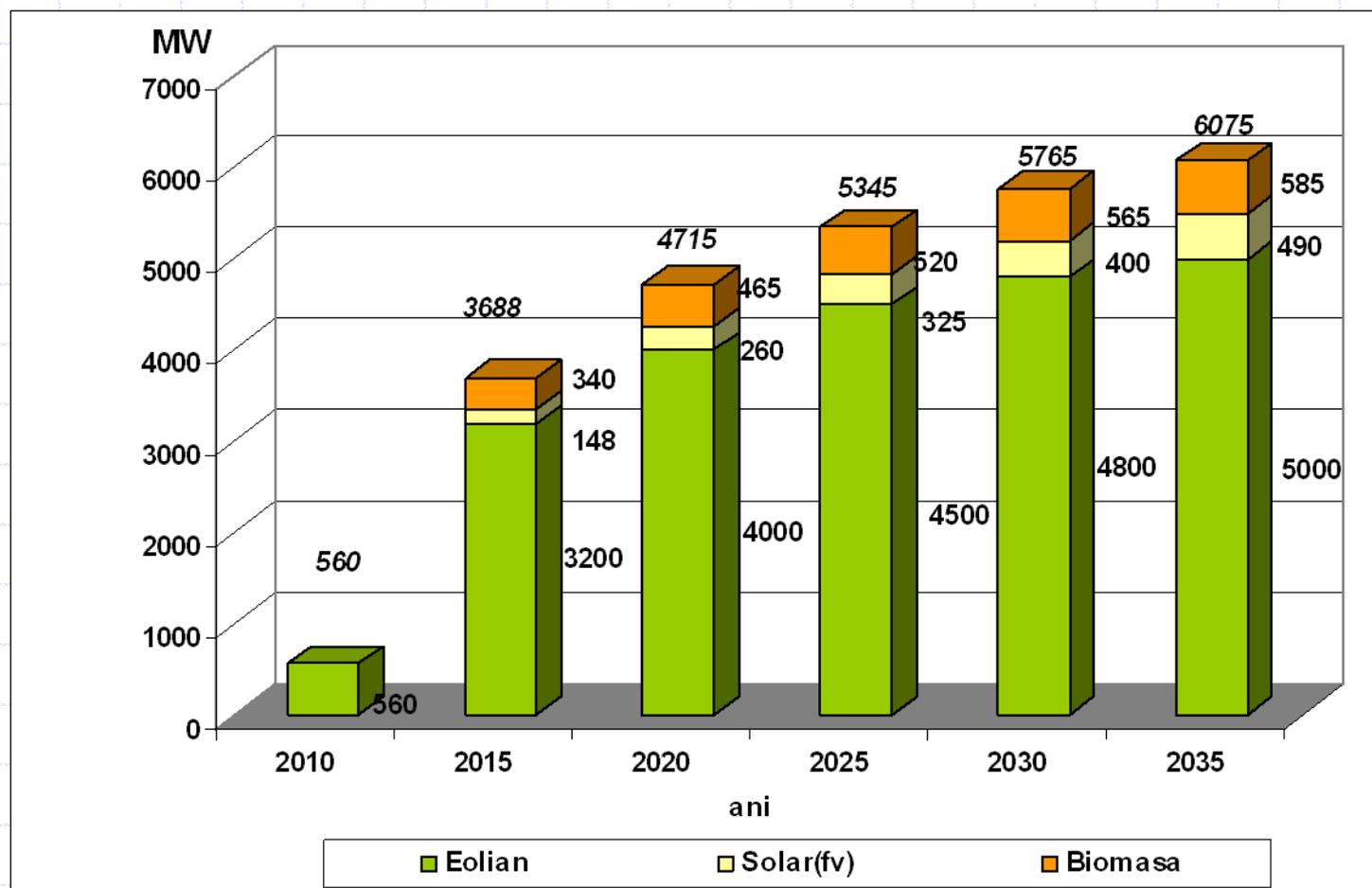
New installed power needed (reference scenario)





Revised Energy Strategy

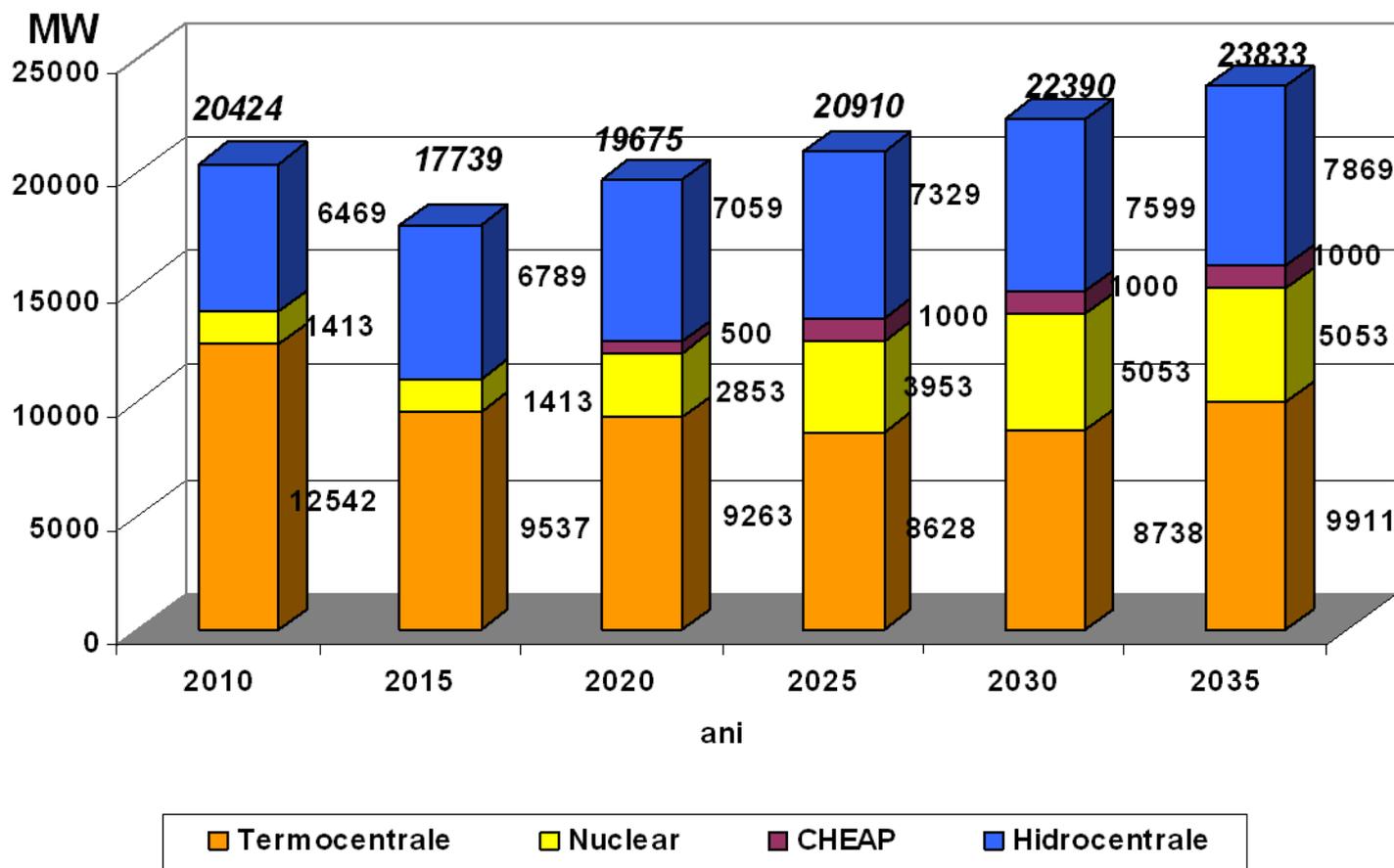
New installed power – best structure renewables excl. hydro





Revised Energy Strategy

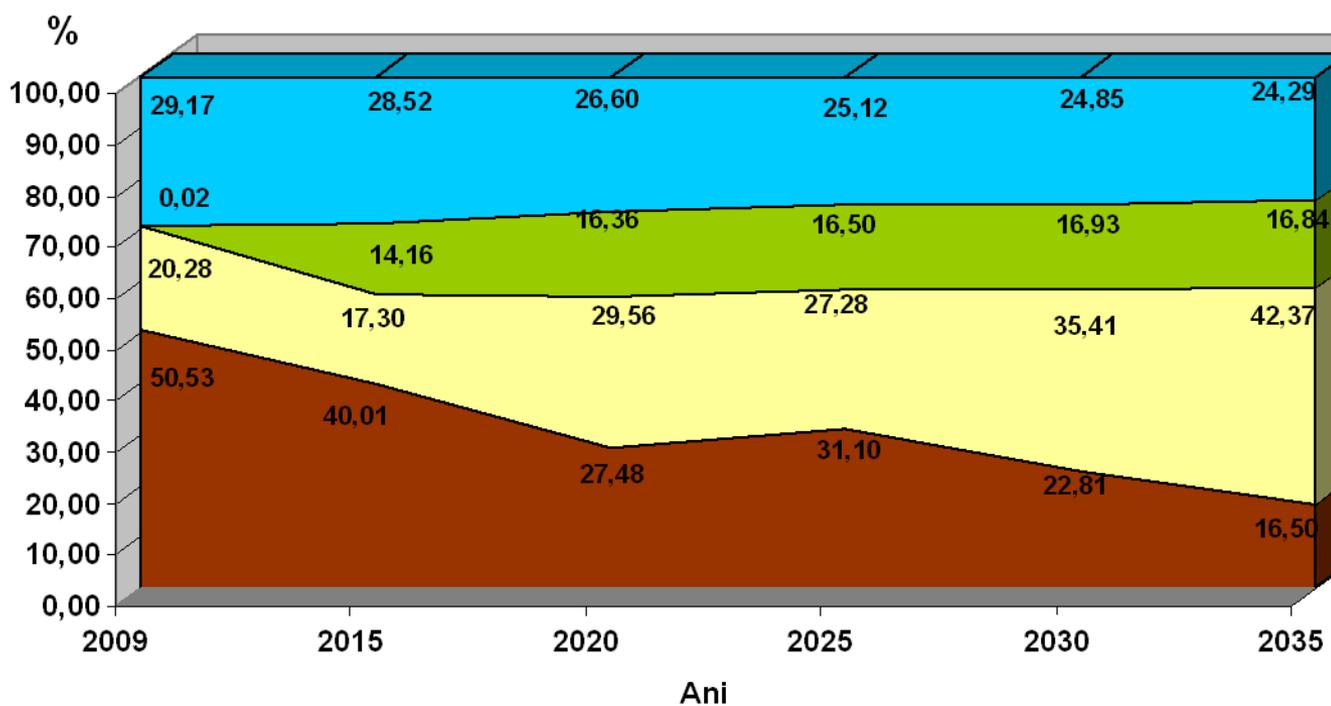
New installed power – best structure classical incl. hydro





Revised Energy Strategy

Electricity production structure



■ In centrale pe combustibili fosili

■ Centrale nuclearelectrice

■ Centrale pe SRE

■ Centrale hidroelectrice si microhidro



Revised Energy Strategy

Actions:

- Increasing security of supply both in terms of fuel mix and network infrastructure;
- Choose a balanced energy mix, giving the energy sector competitiveness and security of supply with emphasis on internal resources, namely coal, hydropower potential economically arranged, nuclear energy and renewable energy sources;
- The efficient and rational use of exhaustible primary energy sources in Romania and maintaining an acceptable level (in terms of economic and security), import of primary energy sources (dependence on limited / controlled);
- Uranium diversifying supply sources by combining the rational exploitation of national resources to import uranium and / or leasing of uranium deposits outside Romania to exploit them;
- Increasing energy efficiency throughout the chain: extraction - production - transmission & distribution - consumption,



Revised Energy Strategy

- Promoting the use of renewable energy sources in accordance with EU practices;
- Improving the competitiveness of electricity markets and natural gas, correlation and active participation in the formation of the internal energy market of the European Union and the development of border trade by taking into account the interests of consumers in Romania and Romanian companies;
- Creating market conditions that stimulate greater energy savings and increased investment in low carbon technologies, the electricity market operator OPCOM will provide short-term reference prices (spot market) price and future reference (forward market) in terms of liquidity provided by focusing on the markets managed transactions.
- Processing and transmission of electricity distribution networks and intelligent widespread deployment of smart metering systems;
- Ensuring investment in energy sector development, including through attracting private capital and funds provided by the EU;
- Increased capacity for innovation and technological development;



Revised Energy Strategy

- environmental objectives and reduce emissions of greenhouse gases;
- Implementation of the safe radioactive waste management technologies;
- reduce vulnerability and increase security of critical energy infrastructure - large hydropower plants, nuclear power, energy transmission;
- proactive participation in the European Union's efforts to formulate an energy strategy for Europe, tracking and promoting the interests of Romania;
- supporting research - developing new technologies to increase production efficiency and energy consumption and environmental protection, and special education;

Conclusions

Romania has an advanced energy market and an attractive environment for investments in energy sector – in line with EU legislation;

Romania has natural energy resources, including unused renewable potential in wind, hydro, solar, biomass and geothermal;

Romanian energy strategy basic answers to the new challenges are:

- ✓ Promotion of renewable energy sources;
- ✓ **Promotion of nuclear energy;**
- ✓ Promotion of indigenous coal with clean technologies;
- ✓ Diversifying the sources and routes of primary energy sources supply;
- ✓ Increase interconnection capacity (electricity, gas) and storage capacity (gas, oil);
- ✓ Increase energy efficiency.



Thank you for your attention !

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