



Promoting renewable energy sources in Romania

Alexandru Sandulescu

General Director – Energy, Oil and Gas Department

Romanian Ministry of Economy



First chapter

Romanian power system

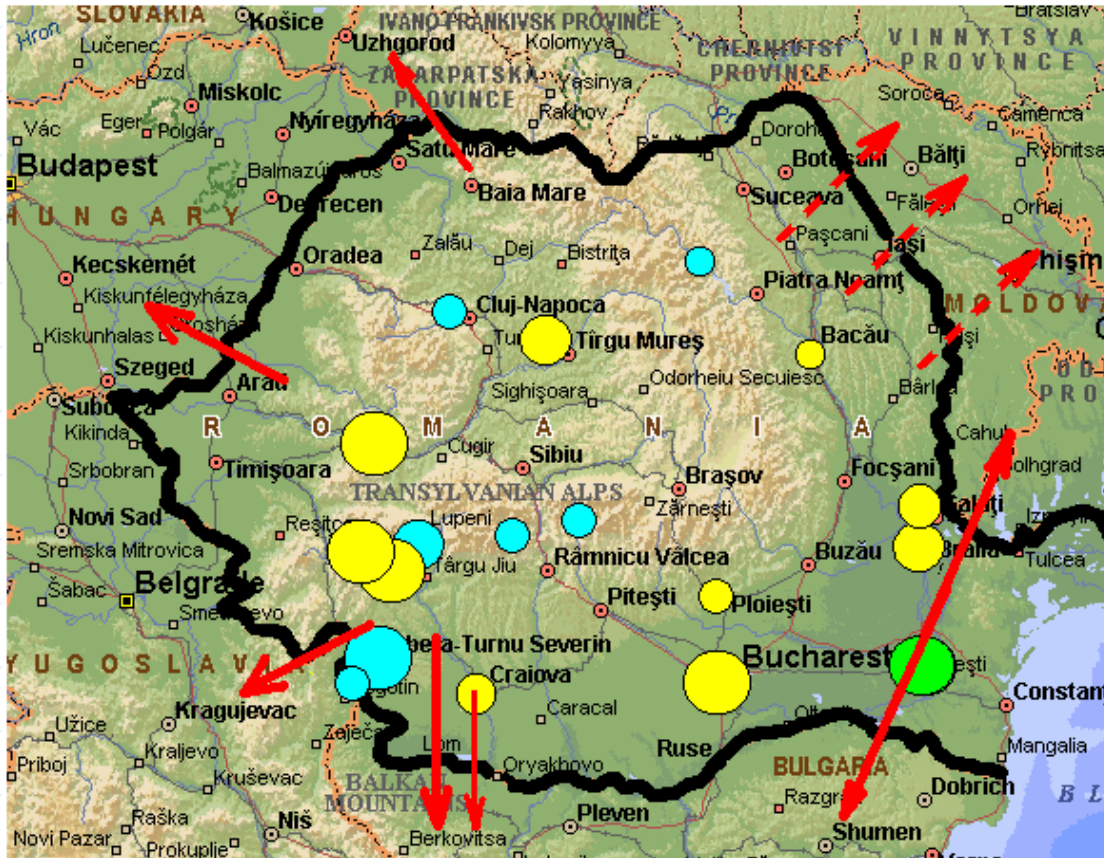
Renewable energy sources potential and use

Promotion mechanisms

Future steps



Romanian electricity sector



Basic data

Overhead transmission lines:
8800 km

Transmission substations: 76

Distribution lines: 310127 km

Distribution substations: 1296

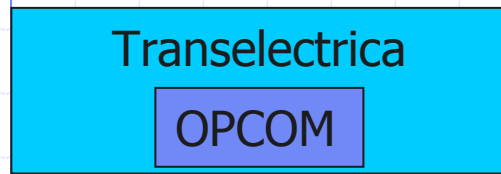
Consumers: 8537476

National consumption:
54.6 TWh (2008)

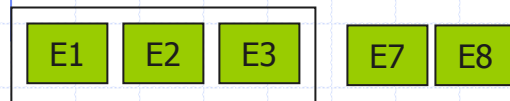


Romanian electricity sector

Companies structure



Transmission and system operator
Commercial operator



8 distribution companies (DISCOs)



Producer with hydro power plants



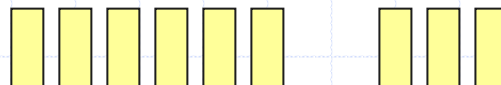
Producers with thermal power plants



Almost 20 municipal cogen producers



Producer with nuclear power plant

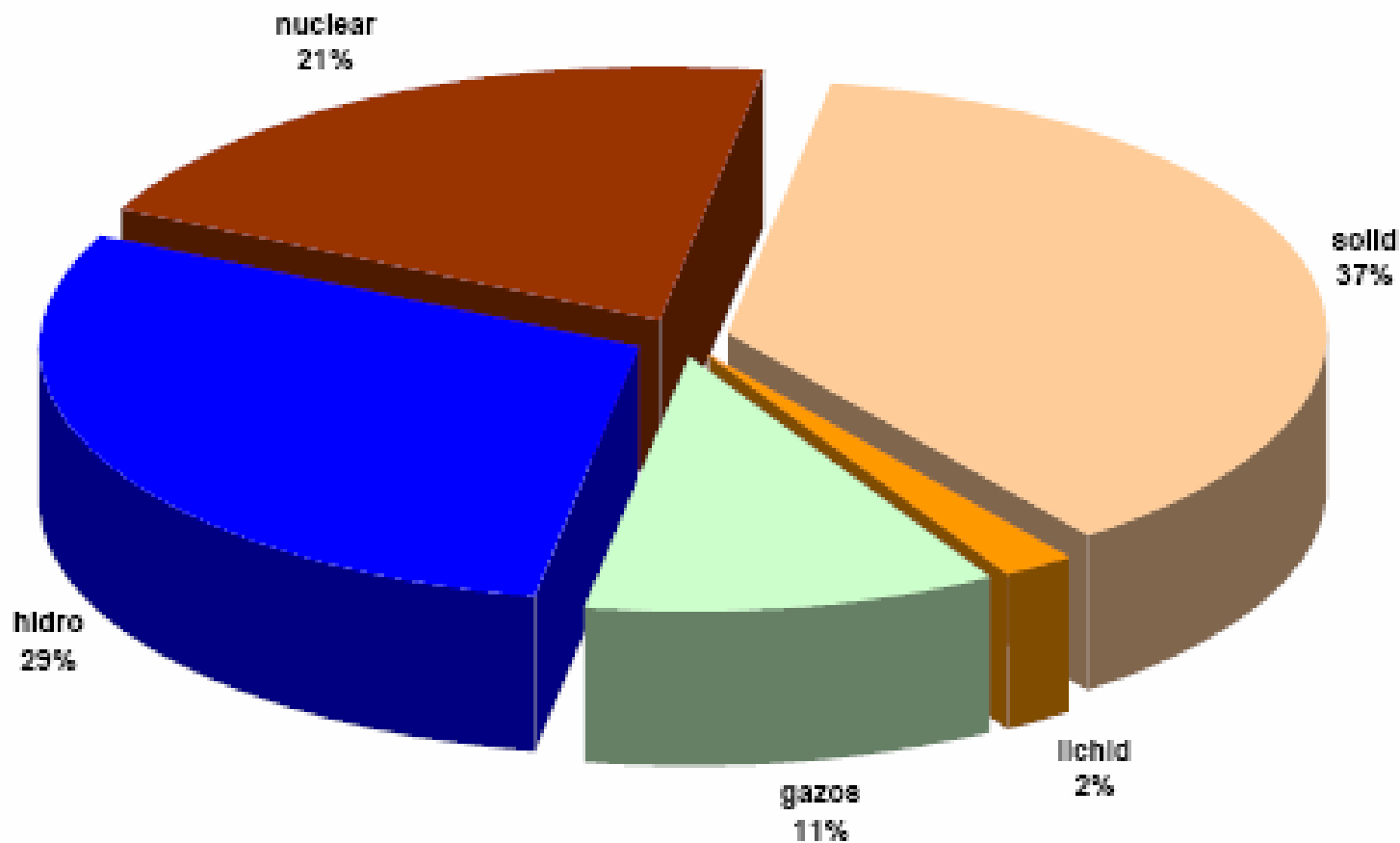


More than 120 independent suppliers



Romanian electricity sector

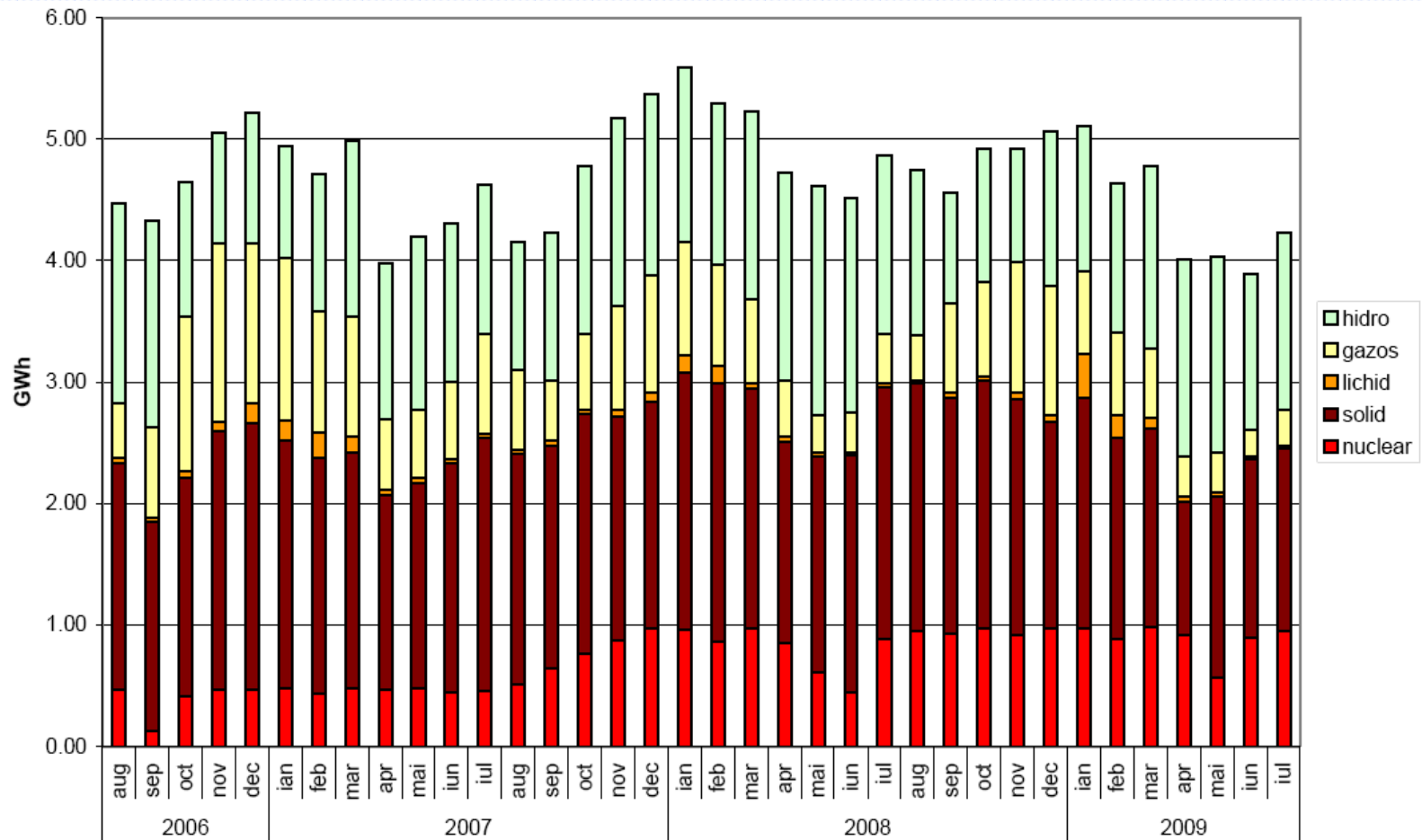
Electricity generation structure 2009





Romanian electricity sector

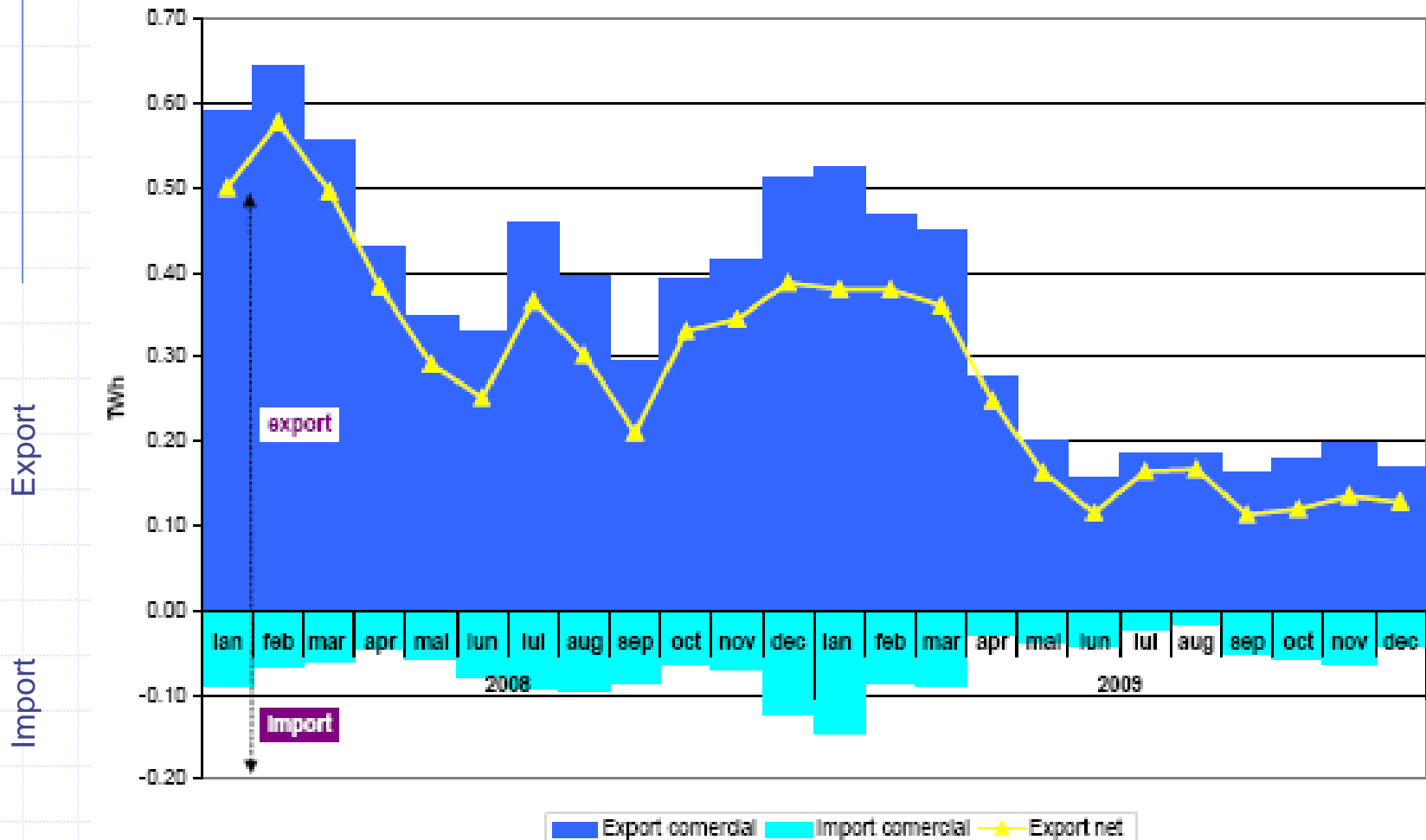
Electricity generation variability





Romanian electricity sector

Electricity export / import balance





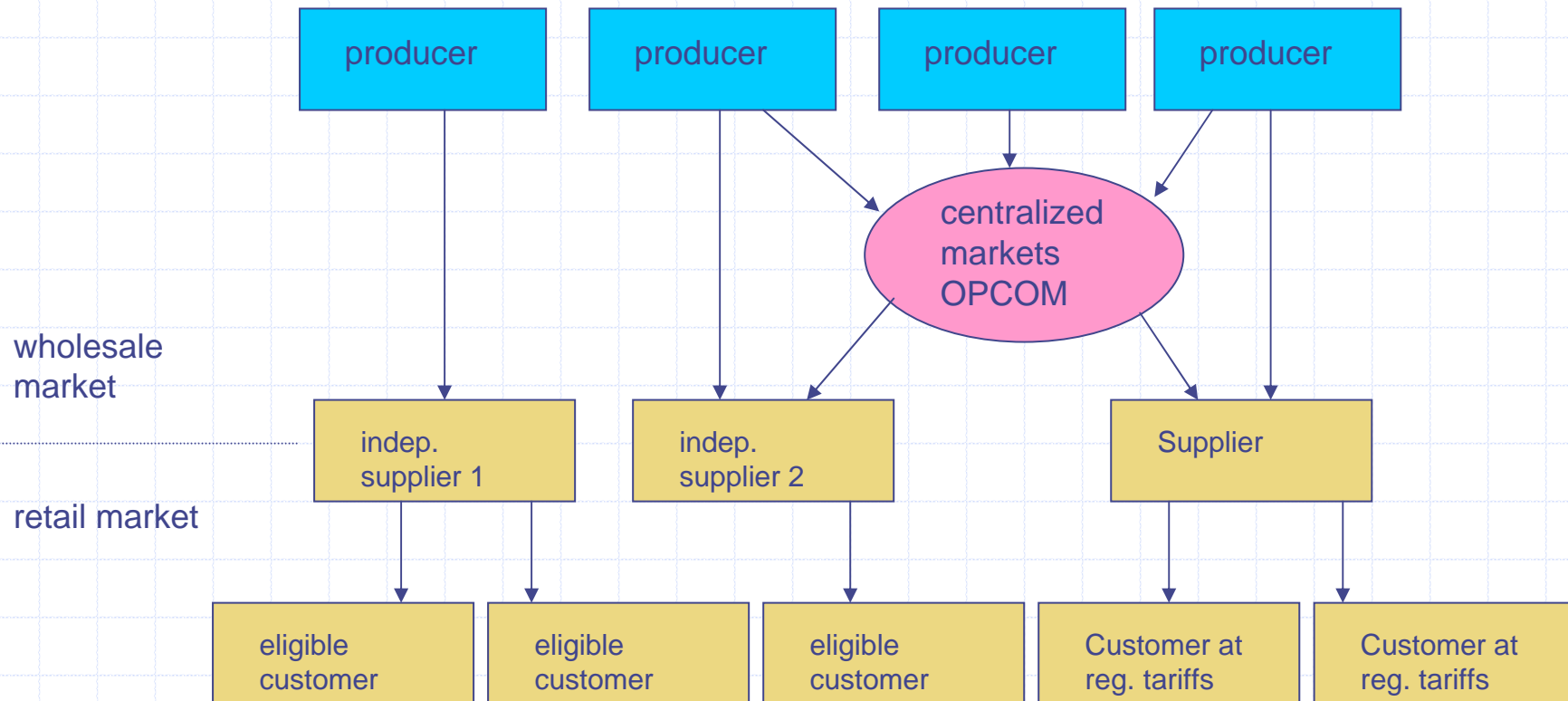
Romanian electricity market

- ✓ 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<
 - ✓ Market settlement.
- ✓ Balancing Market operated by the TSO, Transelectrica



Romanian electricity market

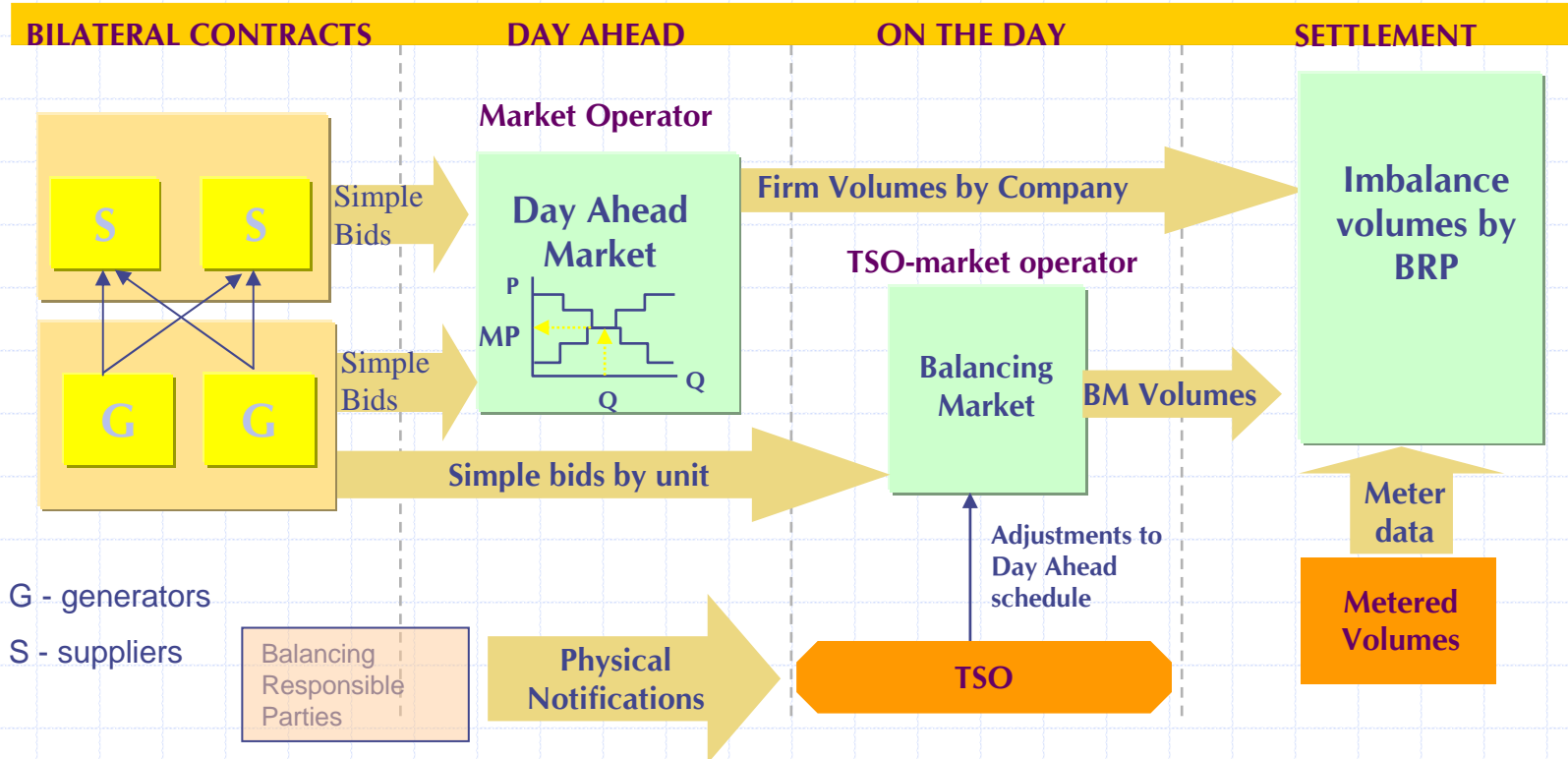
Wholesale vs. retail electricity market





Romanian electricity market

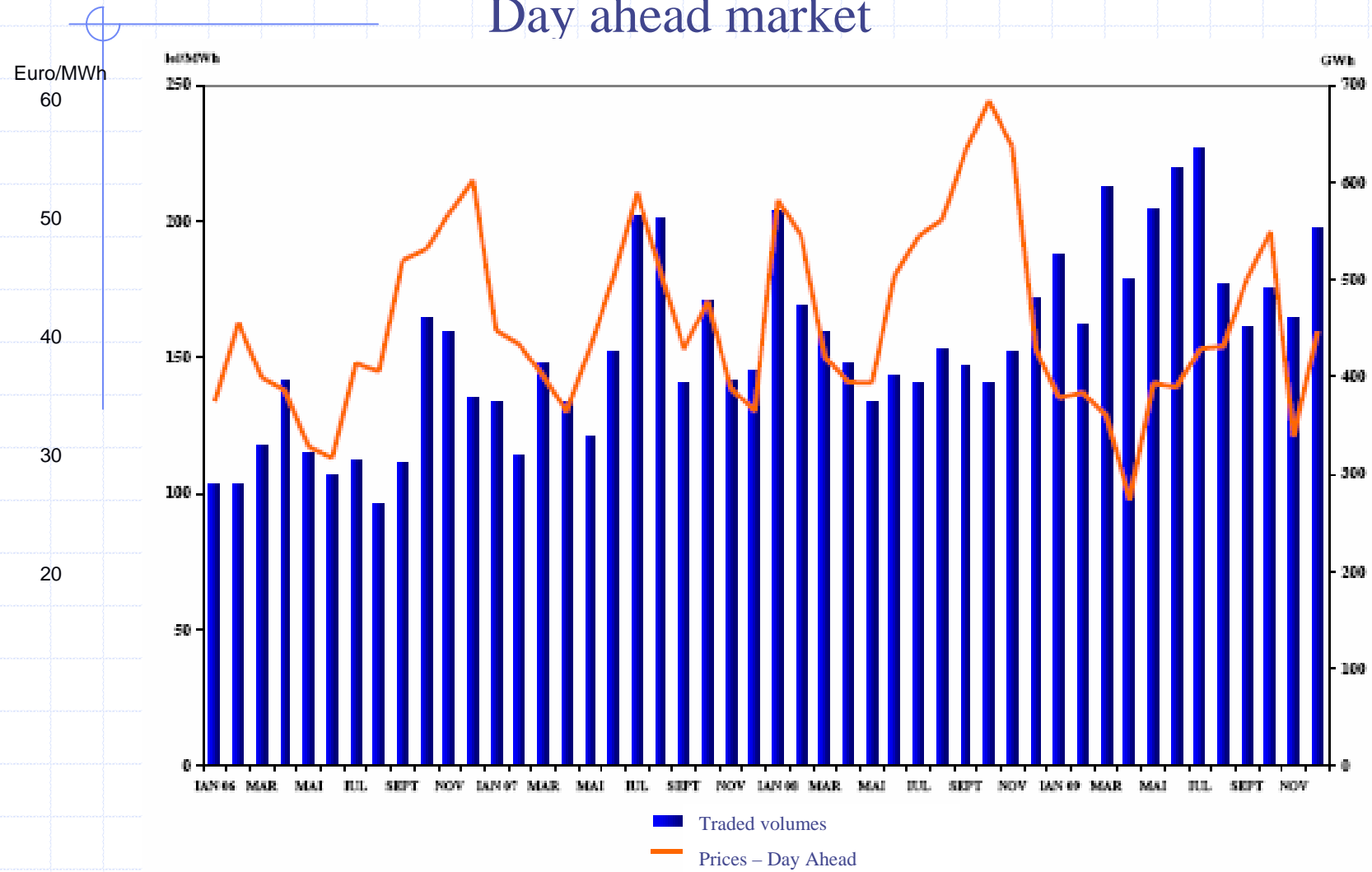
Wholesale electricity market





Romanian electricity market

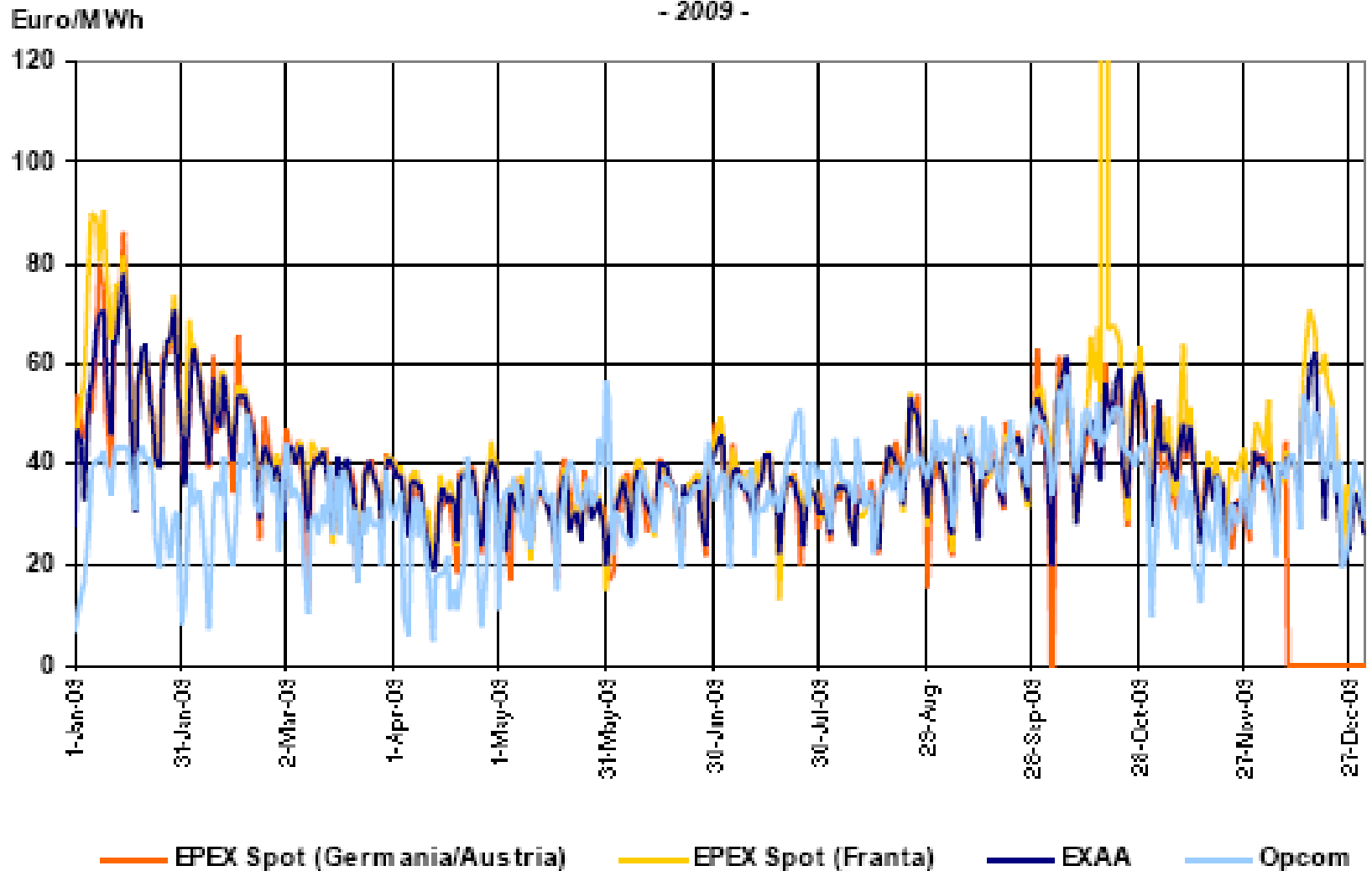
Day ahead market





Romanian electricity market

Day ahead market





Second chapter

Romanian power system

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Targets – share of renewables

Directive 2001/77/EC (amended by 2006/108/EC) :

- ✓ 33 % of gross electricity consumption in 2010

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

Directive 2009/28/EC

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



National potential of renewables

The national renewable energy sources potential

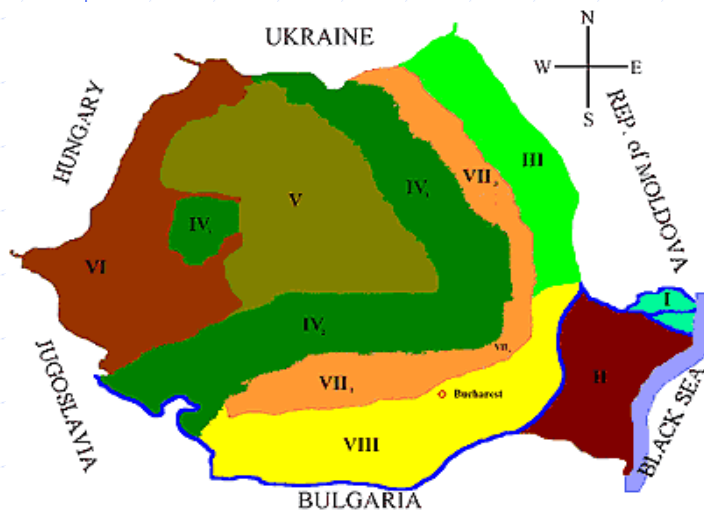
| Source | Annual potential | To be used for: |
|-------------------------------|---------------------|---------------------|
| Solar | 60 PJ/an 1,2 TWh | Heat Electricity |
| Wind | 23 TWh | Electricity |
| Hydro of which under 10 MW | 36 TWh 3,6 TWh | Electricity |
| Biomass and biogas | 318 PJ | Heat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



National potential of renewables

Distribution of the renewable energy sources potential



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



National use of renewables

Operational:

- hydro – 6440 MW
- wind – 14.9 MW
- biomass/biogas – 8.1 MW
- solar – 0.0088 MW

Under construction:

- hydro / 131 MW
- wind – 1001.1 MW
- biomass/biogas – 27 MW



Third chapter

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Legislation

Electricity law (13 / 2007)

Renewables promotion law (220 / 2008)

National energy strategy for 2007 – 2020 (GD 1069 / 2007)

Renewable promotion strategy (GD 1535 / 2003)

Promotion mechanism (GD 443 / 2004....)

Secondary legislation issued by Energy Regulatory Authority (ANRE)

Operational procedures issued by Opcom (market operator) and Transelectrica
(TSO)



Incentives for investments

Structural funds

2008 call:

- ✓ 50 projects received
- ✓ 14 projects selected
- ✓ structural funds allocated: approx. 70 mil. Euro

2010 call:

- ✓ opened between January 2010 and April 2010;
- ✓ structural funds: approx. 100 mil. Euro
- ✓ revised *Applicant Guide*
- ✓ 419 proposals received, representing 20 x the available fund



Green certificate market

Promotion of renewable energy sources - Green certificates market

Green certificate market

Producers

Supplier

Competition

Producer on hydro

Green certificates
micro hidro

Electricity
micro hidro

Producer using fossil fuels

Electricity
Coal

Producer with nuclear units

Electricity
Nuclear

Label

Competition

Electricity market



Green certificate market

Promotion of renewable energy sources - Green certificates market

✓ mandatory quotas for suppliers (year / %):

| | | | |
|------|-------|------|-------|
| 2008 | 5.26 | 2015 | 10.80 |
| 2009 | 6.28 | 2016 | 12.00 |
| 2010 | 8.30 | 2017 | 13.20 |
| 2011 | 8.30 | 2018 | 14.40 |
| 2012 | 8.30 | 2019 | 15.60 |
| 2013 | 9.00 | 2020 | 16.80 |
| 2014 | 10.00 | | |

minimum and maximum price levels established by the regulator:

minimum value 27 Euro / MWh

maximum value 55 Euro / MWh



Green certificate market

Promotion of renewable energy sources - Green certificates market

Number of certificates per MWh:

- ✓ hydro under 10 MW: 1 certificate (0.5 for old, un-refurbished hydro units);
- ✓ wind: 2 certificates till 2015, one after 2015;
- ✓ biomass / biogas: 3 certificates;
- ✓ solar: 4 certificates.

Green certificates are issued for:

- ✓ 15 years for new units;
- ✓ 5 years for second hand units;
- ✓ 10 years for refurbished hydro units;
- ✓ 3 years for old, un-refurbished hydro units;
- ✓ 10 years for geothermal units above 5 MWth.



Green certificate market

Promotion of renewable energy sources - Green certificates market

Investments must be done before 2014 !

Penalties for non compliance of suppliers: 70 Euro per non acquired certificate

Revenues from penalties to be used in network enforcements

ANRE can adjust quotas if it is a high imbalance on the green certificate market

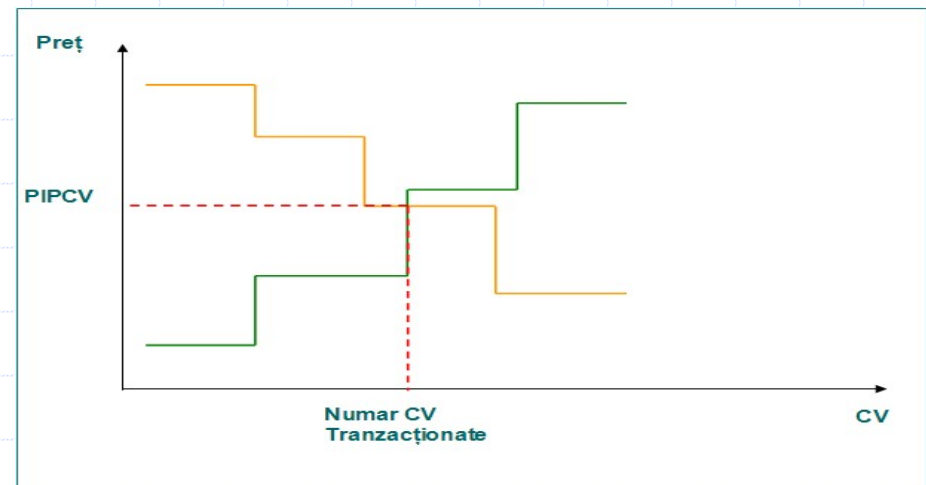


Green certificate market



Organized by Energy Market Operator - OPCOM

| Luna de Tranzactionare : ianie 2009 | | | | |
|--------------------------------------------|----------------------|------------------------|---------------------------------------------------|-------------------------------------------------|
| Număr ofertanți | Număr oferte vânzare | Număr oferte cumpărare | Voluam tranzactionat [Numar certificate verzi] | Pret de inchidere al PCCV [RON / Certificat] |
| 28 | 9 | 19 | 10343 | 215,34 |





Fourth chapter

Romanian power system

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Future steps

- ✓ EU DG Competition approval
 - ✓ is it state aid ?
 - ✓ is it overcompensation ?
- ✓ Adjustments of Law 220 / 2008
- ✓ Transposition of Directive 28 / 2009
- ✓ New intra-day markets to be operated by Opcom, the market operator



Thank you for your attention !

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sandulescu@minind.ro