The Energy Sector in Romania. Present and Future

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ROMANIAN ENERGY REGULATORY AUTHORITY
27th of April, 2012
Romanian Electricity Sector
Romanian electricity sector

Electricity sector structure

- **Transelectrica**
  - Transmission and system operator
  - Commercial operator

- **Hidroelectrica**
  - Producer with hydro power plants

- **Nuclearelectrica**
  - Producer with nuclear power plant
  - Almost 20 municipal cogen producers

- More than 170 independent suppliers

- 8 distribution companies (DISCOs)
  - Producers with thermal power plants
Romanian electricity sector

Overhead transmission lines: 8800 km
Transmission substations: 76
Distribution lines: 310127 km
Distribution substations: 1296
Consumption: 54.6 TWh (2008), 49.9 TWh (2009), 53.4 TWh (2010) approx 55 TWh (2011)
Procentul energiei electrice distribuite de fiecare operator principal de distribuție a energiei electrice

Valori aferente anului 2008

*Conform Ordinului 39/2007 prin operator principal de distribuție (ODP) se înțelege operatorul de distribuție care distribuie energie electrică la mai multe de 100.00
Romanian electricity sector

Electricity generation structure 2010
By producers

Hidroelectrica; 36%
Nuclearelectrica; 19%
Termoelectrica; 2%
CE Craiova; 7%
El Deva; 3%
CE Rovinari; 9%
Elen Busuresti; 6%
CE Turceni; 10%
Other; 7%

C1 - 36%
C3 - 65%
HHI - 1947
Romanian electricity sector

Electricity generation structure 2011
By producers (Ian – Sept)

C1 - 30%
C3 - 62%
HHI - 1642

Hidroelectrica; 29.9%
Nuclearelectrica; 19.0%
Tomis Team; 1.1%
RAAN; 2.0%
Alti; 5.8%
Elcen; 5.8%
CE Craiova; 8.7%
El Deva; 3.5%
CE Rovinari; 9.3%
CE Turceni; 12.8%

EDP; 0.2%
Cernavoda; 0.2%
Enel Green Power; 0.1%
CET Arad; 0.3%
CET Bacau; 0.3%
CET Brasov; 0.1%
Dalkia Termo; 0.7%
El Galati; 0.9%
CET Govora; 0.9%
CET Iasi; 0.4%
El Oradea; 0.4%
Lukoil; 0.2%
Termica Sv; 0.2%
Petrom; 0.7%
Romanian electricity sector

Electricity generation structure 2010
By primary sources

- Nuclear: 19.4%
- Hydro: 35.7%
- Solid: 33.8%
- Gas: 10.2%
- Lichid: 0.9%
Romanian electricity sector

Electricity generation structure 2011 September

Hydro production low – due to the drought
Romanian electricity sector

Hydro reserve in main lakes – 2011 drought year

Blue: attention limit
Green: no commercial operation allowed for hydro units
Romanian electricity sector

Electricity generation variability

Source: ANRE
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

- Wholesale market
  - producer
  - independ. supplier 1
  - eligible customer

- Retail market
  - producer
  - independ. supplier 2
  - eligible customer
  - Implicit Supplier 1…8
  - Customer at reg. tariffs
  - Customer at reg. tariffs

Centralized markets OPCOM
Romanian electricity market

Wholesale electricity market

BILATERAL CONTRACTS

Day Ahead Market

Simple Bids

Firm Volumes by Company

Balancing Market

Simple bids by unit

Adjustments to Day Ahead schedule

TSO

Imbalance volumes by BRP

Metered Volumes

G - generators

S - suppliers

Balancing Responsible Parties

Physical Notifications

TSO-market operator

TSO-market operator

G - generators

S - suppliers

Balancing Responsible Parties

Physical Notifications
Romanian electricity market

Wholesale electricity market

Monthly traded volumes 2011

Balancing market
Day ahead market
Forward market
Negotiated contracts
Regulated contracts
Romanian electricity market

Retail market opening

Legal market opening

Real market opening
Romanian electricity market
Day ahead market – volumes and prices
Romanian electricity market
Day ahead market – comparing to other markets

Euro/MWh

septembrie 2011

Max EXAA: 76 Euro/MWh
Max Opcom: 82 Euro/MWh
Romanian electricity market

Recent developments

- Adjusting market
- Intra-day markets

Market coupling discussions with neighboring countries

Future developments

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

- Opcom - energy market operator and
- BVB – Bucharest Stock Exchange
Promoting renewable energy sources
Targets – share of renewables

✓ 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

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

**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. Carpații Moutain (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).
Legislation

- Electricity law (13 / 2007)
- Renewables promotion law (220 / 2008, revised in 2010 by Law 139/2010)
- Renewable energy promotion strategy (GD 1535 / 2003)
- Promotion mechanism by green certificates (GD 443 / 2004....)
- Secondary legislation issued by Energy Regulatory Authority (ANRE)
- Operational procedures issued by Opcom (market operator) and Transelectrica (TSO)
Incentives for investments in renewables

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. 180 mil. Euro
✓ revised Applicant Guide
✓ 419 proposals received, representing 9 x the available fund

2011
✓ another 100 mil. Euro allocated for renewables (for projects submitted in 2010 call)
STAGES FOR WIND POWER PLANT DEVELOPMENT AND COMMISSIONING

Local Administration Public Authorities
1 Certificat Urbanism
5 Autorizatie de constructie

Network Operators
2.1 Aviz Amplasament
2.2 Studiu de solutie
2.3 Aviz tehnic de racordare

Environment Authorities
3 Acord Mediu

ANRE
4 Autorizatie de infiintare
8 Licenta producere

6.1 Incheiere contract racordare
6.2 Punere sub tensiune capacitati de producere
7 Autorizatie de mediu
Promotion of renewable energy sources - Green certificates market

Producers
- Producer on renewables
  - Green certificates
- Electricity
- Coal
- Electricity
- Nuclear units
- Nuclear

Supplier
- Competitions
  - Acquisition quota

Electricity market
- Producer using fossil fuels
- Electricity
- Coal

Green certificate market

Competition
Promotion of renewable energy sources - Green certificates market

Mandatory quotas (year / %):

<table>
<thead>
<tr>
<th>Year</th>
<th>Mandatory quota Law 220/2008 (%)</th>
<th>Mandatory quota Revised Law 220/2008 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>5,26</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>6,28</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>8,30</td>
<td>8,3</td>
</tr>
<tr>
<td>2011</td>
<td>8,30</td>
<td>10,0</td>
</tr>
<tr>
<td>2012</td>
<td>8,30</td>
<td>12,0</td>
</tr>
<tr>
<td>2013</td>
<td>9,00</td>
<td>14,0</td>
</tr>
<tr>
<td>2014</td>
<td>10,00</td>
<td>15,0</td>
</tr>
<tr>
<td>2015</td>
<td>10,80</td>
<td>16,0</td>
</tr>
<tr>
<td>2016</td>
<td>12,00</td>
<td>17,0</td>
</tr>
<tr>
<td>2017</td>
<td>13,20</td>
<td>18,0</td>
</tr>
<tr>
<td>2018</td>
<td>14,40</td>
<td>19,0</td>
</tr>
<tr>
<td>2019</td>
<td>15,60</td>
<td>19,5</td>
</tr>
<tr>
<td>2020</td>
<td>16,80</td>
<td>20</td>
</tr>
</tbody>
</table>

Minimum and maximum price levels:
- minimum value 27 Euro / certificate
- maximum value 55 Euro / certificate
Promoting strategy of E-SRE in Romania

Energy market
- Price on the energy market

Green certificates market
- Market price of green certificates

Energy
- Green Certificates

Price
- E-SRE
Annual values of estimated quotas ESRE for 2012

Elements for the annual estimated quotas of GC acquisition for the energy providers in 2012:

<table>
<thead>
<tr>
<th>Nr. crt.</th>
<th>Indicators</th>
<th>U.M.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GC released in 2012</td>
<td>GC</td>
<td>5.515.788</td>
</tr>
<tr>
<td>2</td>
<td>Final consumption of energy in 2012</td>
<td>MWh</td>
<td>48.950.000</td>
</tr>
<tr>
<td>3</td>
<td>Annual quota of GC in 2012</td>
<td>GC/MWh</td>
<td>0.11</td>
</tr>
<tr>
<td>4</td>
<td>Annual quota of GC in 2011</td>
<td>GC/MWh</td>
<td>0.037</td>
</tr>
</tbody>
</table>
## Promoting system of E-SRE in Romania

<table>
<thead>
<tr>
<th>Type SRE</th>
<th>Type group</th>
<th>Number of GC/MWh</th>
<th>Time (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hydraulic energy - used in electrical units with Pi ≤10 MW</td>
<td>new (after 1 ian. 2004)</td>
<td>3GC</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>refurbished</td>
<td>2 GC</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Until 1 ian. 2004 and nonrefurbished</td>
<td>0.5 GC</td>
<td>3</td>
</tr>
<tr>
<td>2. Wind energy</td>
<td>new</td>
<td>2 GC until 2017</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 GC up to 2018</td>
<td></td>
</tr>
<tr>
<td>3. Biomass, biogas, biofuels, geothermal energy</td>
<td>new</td>
<td>2-3GC</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>High efficiency cogeneration (over 3 GC)</td>
<td>1 GC</td>
<td>15</td>
</tr>
<tr>
<td>4. Solar energy</td>
<td>new</td>
<td>6 GC</td>
<td>15</td>
</tr>
</tbody>
</table>
Promotion of renewable energy sources - Green certificates market

*Investments must be done before 2016!*

Penalties for non compliance of suppliers: 110 Euro per non acquired certificate
Revenues from penalties to be used by *Environment Fund*

ANRE must calculate the GC Acquisition quotas
ANRE can adjust quotas if it is a high imbalance on the green certificate market
Green certificate market

Organized by Energy Market Operator - OPCOM

<p>| Luna de Tranzactionare: MARTIE 2011 |
|-------------------------------|-------------------------------|-------------------------------|</p>
<table>
<thead>
<tr>
<th>Număr ofertanți</th>
<th>Număr oferte vânzare</th>
<th>Număr oferte cumpărare</th>
<th>Volum tranzactionat</th>
<th>Pret de inchidere al PCCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>22</td>
<td>13</td>
<td>42.871</td>
<td>241,04</td>
</tr>
</tbody>
</table>

Pret

PIPCV

Numar CV Tranzactionate

CV
National Renewable Energy Action Plan

Final document published on the website www.minind.ro

More than 200 pages

Large collaboration between ministries

Consultants: ICEMENERG (coordinator), ISPE, ICPE

Currently under evaluation by European Commission
### National Renewable Energy Action Plan

#### WIND

Installed capacity in wind: 14 MW (2009); 469 MW (2010); 890 MW (2011)

Wind investments under development:

<table>
<thead>
<tr>
<th>Network operator</th>
<th>Connection contracts</th>
<th>Connection permits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Producers</td>
<td>Installed power (MW)</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-----------</td>
<td>---------------------</td>
</tr>
<tr>
<td>TRANSELECTRICA</td>
<td>3</td>
<td>600</td>
</tr>
<tr>
<td>Enel Dobrogea</td>
<td>58</td>
<td>1538,56</td>
</tr>
<tr>
<td>FDEE Electrica Distributie Muntenia Nord</td>
<td>30</td>
<td>376,03</td>
</tr>
<tr>
<td>E.ON Moldova</td>
<td>7</td>
<td>16,69</td>
</tr>
<tr>
<td>Enel Banat</td>
<td>3</td>
<td>89</td>
</tr>
<tr>
<td>CEZ (as distributor)</td>
<td>1</td>
<td>1,8</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>102</strong></td>
<td><strong>2622,08</strong></td>
</tr>
</tbody>
</table>
### National Renewable Energy Action Plan

#### Indicative trajectory

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating &amp; Cooling</td>
<td>3516</td>
<td>2819</td>
<td>2834</td>
<td>3000</td>
<td>2969</td>
<td>2925</td>
<td>3000</td>
<td>3058</td>
<td>3220</td>
<td>3390</td>
<td>3707</td>
<td>4038</td>
</tr>
<tr>
<td>Electricity</td>
<td>1347</td>
<td>1435</td>
<td>1624</td>
<td>1802</td>
<td>1991</td>
<td>2195</td>
<td>2333</td>
<td>2448</td>
<td>2511</td>
<td>2566</td>
<td>2621</td>
<td>2666</td>
</tr>
<tr>
<td>Transport</td>
<td>58</td>
<td>275</td>
<td>310</td>
<td>345</td>
<td>375</td>
<td>405</td>
<td>436</td>
<td>458</td>
<td>483</td>
<td>511</td>
<td>542</td>
<td>564</td>
</tr>
<tr>
<td>Overall energy</td>
<td>4921</td>
<td>4529</td>
<td>4768</td>
<td>5147</td>
<td>5335</td>
<td>5525</td>
<td>5769</td>
<td>5964</td>
<td>6214</td>
<td>6467</td>
<td>6870</td>
<td>7267</td>
</tr>
</tbody>
</table>

To be produced from renewable energy sources in 2020:

\[
30278 \text{ ktep} \times 24\% = 7267 \text{ ktep}
\]

- 1700 MW în 400kV Tariverde power station;
- 600 MW în Vânt power station;
- 354 MW în Moldova: Fălciu Berezeni, Roşieşti, Vetrişoaia, Smârdan-Gutinas;
- 105 MW în Tulcea County: Baia and Corugea-Cișmeaua Nouă;
- 90 MW în Medgidia Sud area: Peştera;
- 120 MW în Medgidia Nord area: Târgușor and Siliștea.

Total: 3000 MW
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

<table>
<thead>
<tr>
<th>Source</th>
<th>Geological reserves</th>
<th>Concessioned areas</th>
<th>New areas</th>
<th>Estimated annual production</th>
<th>Forecasted depletion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mil. ton 1)</td>
<td>Mil. tep 1)</td>
<td>Mil. ton 1)</td>
<td>Mil. tep</td>
<td>Mil. tep</td>
</tr>
<tr>
<td></td>
<td>Coal</td>
<td>hard coal</td>
<td>755</td>
<td>422</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>lignite</td>
<td>1490</td>
<td>276</td>
<td>445</td>
<td>82,4</td>
</tr>
<tr>
<td></td>
<td>Oil</td>
<td>74</td>
<td>72</td>
<td></td>
<td>5,2</td>
</tr>
<tr>
<td></td>
<td>Natural gas</td>
<td>185</td>
<td>159</td>
<td></td>
<td>12,5</td>
</tr>
<tr>
<td></td>
<td>Uranium 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) excluding natural gas expressed in mld. Mc

2) data not public
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.
Reducing CO\(_2\) 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
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).
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).
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

### Yearly GDP increase [%]

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Reference scenario</td>
<td>-7.10</td>
<td>-1.90</td>
<td>1.50</td>
<td>3.90</td>
<td>4.50</td>
<td>4.70</td>
<td>4.60</td>
<td>3.80</td>
<td>3.30</td>
<td>3.20</td>
</tr>
<tr>
<td>Unfavorable scenario 1</td>
<td>-7.10</td>
<td>-4.43</td>
<td>-3.56</td>
<td>0.75</td>
<td>2.35</td>
<td>3.93</td>
<td>4.20</td>
<td>2.94</td>
<td>2.61</td>
<td>2.46</td>
</tr>
<tr>
<td>Unfavorable scenario 2</td>
<td>-7.10</td>
<td>-2.60</td>
<td>-0.38</td>
<td>1.66</td>
<td>1.46</td>
<td>0.16</td>
<td>3.60</td>
<td>2.58</td>
<td>2.40</td>
<td>2.31</td>
</tr>
</tbody>
</table>

### Graphical Representation

- **2008-2035**
- **Yearly GDP increase [%]**
- **Reference scenario**: Blue line
- **Unfavorable scenario 1**: Pink line
- **Unfavorable scenario 2**: Green line

### Yearly GDP forecast

- **Reference scenario**
  - GDP forecast from 2009 to 2035
- **Unfavorable scenario 1**
  - GDP forecast from 2009 to 2035
- **Unfavorable scenario 2**
  - GDP forecast from 2009 to 2035
## Revised Energy Strategy

### National electricity consumption forecast

#### Yearly energy consumption increase [%]

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Reference scenario</strong></td>
<td>-7.97</td>
<td>2.36</td>
<td>2.70</td>
<td>2.70</td>
<td>2.70</td>
<td>2.70</td>
<td>2.70</td>
<td>2.60</td>
<td>2.20</td>
<td>1.30</td>
<td>1.14</td>
</tr>
<tr>
<td><strong>Unfavorable scenario 1</strong></td>
<td>-7.97</td>
<td>2.36</td>
<td>1.31</td>
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<td>1.31</td>
<td>1.31</td>
<td>1.57</td>
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<tr>
<td><strong>Unfavorable scenario 2</strong></td>
<td>-7.97</td>
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<td>1.28</td>
<td>1.28</td>
<td>1.07</td>
<td>0.99</td>
<td>1.01</td>
<td>0.99</td>
<td>0.86</td>
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</table>
**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 %)

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<tbody>
<tr>
<td>Installed power</td>
<td>3820</td>
<td>1724</td>
<td>1075</td>
<td>2190</td>
<td>2287</td>
<td>11066</td>
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<tr>
<td>Net available power</td>
<td>2641</td>
<td>1511</td>
<td>859</td>
<td>1935</td>
<td>1953</td>
<td>8899</td>
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</tbody>
</table>
Revised Energy Strategy

New installed power needed (reference scenario)
Revised Energy Strategy

New installed power – best structure renewables excl. hydro

![Graph showing new installed power for different years and renewable energy sources]
Revised Energy Strategy

New installed power – best structure classical incl. hydro

![Bar chart showing energy sources by year and power capacity]
Revised Energy Strategy

Electricity production structure

Ani

%
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;
Smart Grids in Romania
Smart Grids in Romania

Action Plan to promote Smart Grids in Romania

- Approved by Ministerial Order No. 2081 /11.11.2010
- Actions:
  - Establishing a Commission in charge with Smart Grid issues
  - Select an international consultant to assist us in elaborating a National Strategy for implementing Smart Grid concepts and a Road Map
  - Proposals of new legislation (drafted by the Commission) in order to have an unitary implementation of smart Grid concepts in Romania
Smart Grids in Romania

Action Plan to promote Smart Grids in Romania

- Actions (cont.):
  - Each Energy company should have its own Smart Grid Commission in order to facilitate the promotion of the new concept
  - Energy companies should finance the necessary studies in order to implement the provisions of the Strategy in their activity
  - Smart Grid Strategy will be a chapter in the new National Energy Strategy
Smart Grids in Romania

Action Plan to promote Smart Grids in Romania

• Priority Action Areas:
  ✓ Integrating renewables and distributed generation
  ✓ Improving electricity quality and energy efficiency
  ✓ Introduction of digital systems in electricity generation, transmission and distribution
  ✓ Cyber security issues
  ✓ Smart metering
  ✓ New EMS – SCADA systems
  ✓ Flatening the load shape through electric cars, pump storage HPP etc.
  ✓ Electricity market issues
  ✓ Supply – consumer issues
Smart Grids in Romania

Action Plan to promote Smart Grids in Romania

• Three stages of implementation
  ✓ Research, pilot projects, new legislation (standards)
  ✓ Investments
  ✓ Operational phase, improvements

• All Smart Grid systems should be based on an open architecture, upgradable and interoperable (for about 25 years)

• Links with other Ministries
Conclusions

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

Romania has an Action Plan to unitary promote Smart Grids;

Romanian energy strategy basic answers to the new challenges are:

- Promotion of renewable energy sources;
- Promotion of nuclear energy (to be reanalyzed);
- 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;
- Increase energy efficiency.
Thank you for your attention!

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