

Recent Energy Sector Development and AERS Responsibilities

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AERS – PA PUC
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- Introduction
- Recent energy sector development
- Development and investment plan
- AERS* responsibilities
- Final remarks/ Conclusion

* - Energy Agency of the Republic of Serbia

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Introduction

- Serbia
 - Historical and geographical basic data
- Beginning of electrification and gasification
 - More than 100 years of electricity usage
 - About 60 years of natural gas usage

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Introduction

Serbia



7th century - first Serbian states
11th century - first kingdom
1345 - Serbian empire
1389 - the first battle with Ottoman empire, at Kosovo field
1540 - 1867 - without independence
1918-1990 ('06) - Yugoslavia
since 2006 - Republic of Serbia

Land Area - 88,361 sq km (34,116 sq miles)
Population - 7.5 Million (without K&M*)
The main religion - Christian orthodox
Estimated GDP 2008 - US\$10,985 pc (IMF)
Capital - Belgrade,
- Latitude 44° N
- Longitude 21° E
- population 1.6 Million



* - K&M – Kosovo & Metohija

First Power Plant based on AC Tesla's principles – 1900 !



HPP Vuče, 1903
(HPP Niagara 1895)

1893 - first public power station, Belgrade
1900 – first HPP based on AC Tesla's principles,
1903 – first, 17km long-distance power line
1900-1911 – the oldest four HPPs, still in operation

First gas well - 1949

- 1949 - the first gas well was activated
- Source of domestic gas – northern Serbia

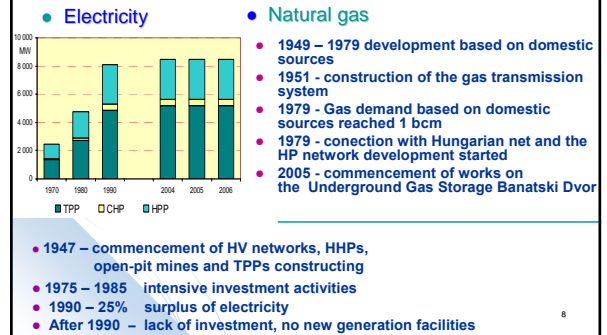
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Recent Energy Sector Development

- **Recent trends**
 - Production capacities and demands
 - Problems in the period 1990-2000
 - Reconstruction and key achievement
- **Current situation**
 - Primary energy demand
 - Dependence on import
 - Balances

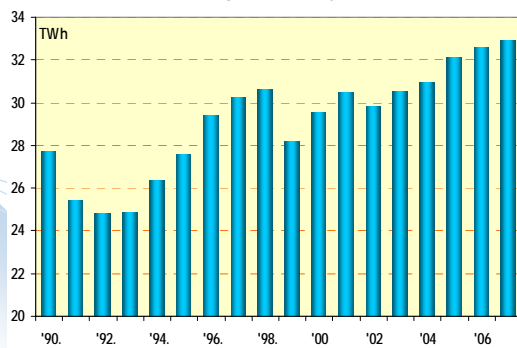
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Historical milestones

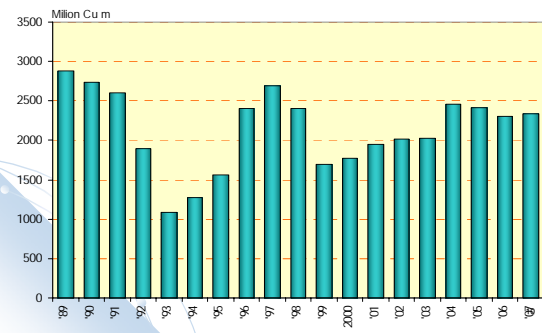


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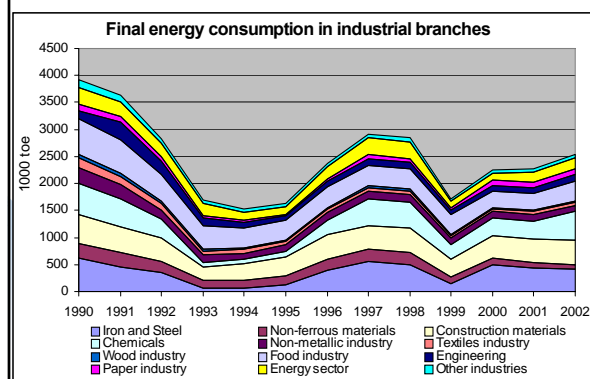
Demand trends (1) Electricity Consumption



Demand trends (2) Natural gas consumption



Demand trends (3)

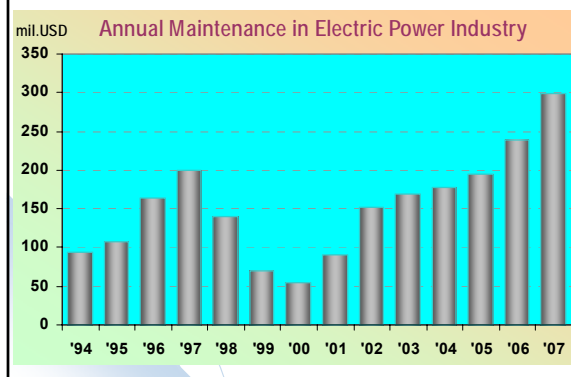


Problems in the period 1990-2000

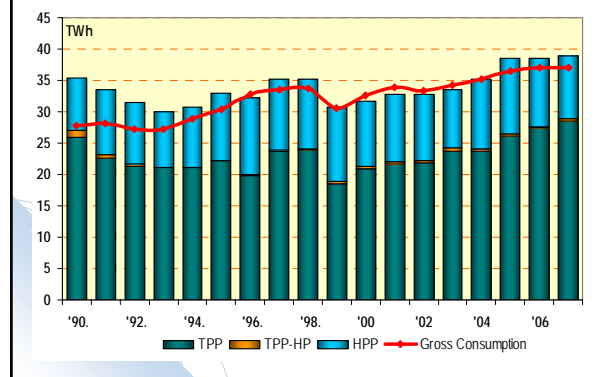
- **International economic sanctions**
 - Lack of liquid fuels and natural gas
 - Lack of money for sustainable development
 - Lack of financial means and spare parts for maintenance
- **Low electricity price**
- **Deteriorated equipment**
 - TPPs and open-pit mines
- **Electricity consumption for household heating**
- **Damage from NATO AIR STRIKES in 1999**
 - Transmission network and TPPs;

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Problems in the period 1990-2000 (2)



Balance of electricity 1990 - 2007



Reconstruction of capacities

- Transmission network - after bombing
 - TPPs
 - Open-pit mines
- after period of lack of maintenances And bombing

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International Community Assistance

Since 2000

450 mil € donations - mostly from EU through EAR

Main areas of assistance:

- Electricity imports
- Fuel for heating
- Spare parts and equipment for PP's and open-pit mines
- Overhauls of TPP's
- District heating systems of Belgrade, Novi Sad and Niš
- Reforms, capacity building and technical assistance

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Results achieved

2000

2007/ '08

Insufficient production
Low efficiency of PP's
Damaged transmission network

• Increased production of coal and electricity
• Repaired and renewed transmission network

During winter season 2000/01
55 days of power cuts
despite International Community Assistance

Since winter season 2002/2003
no power cuts

Average final all consumers
0.8 ¢\$/KWh

New Tariff System &
From August 2008
5.5 ¢€/KWh

TPP's EFOR **34%**

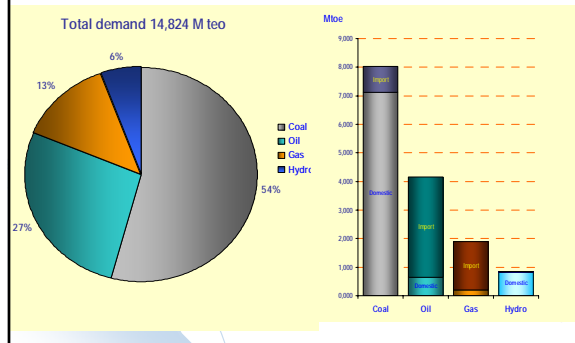
TPP's EFOR **12,6%**

Current situation

- Primary energy demand
- Dependence on import
- Electricity
 - Structure of Power Generation
 - Transmission infrastructure
 - Balances
- Natural gas
 - Transmission infrastructure
 - Demand – gas and electricity

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Primary energy demand – 2007 (1)



Primary energy demand – 2007 (2)

2007

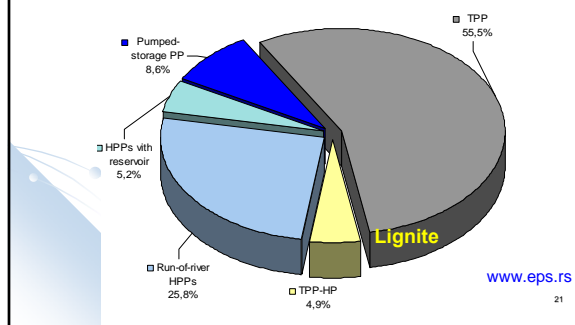
Imported: 41%

- Oil: 87% } dependence increases
- Gas: 92%
- Coal: 11%
- Electricity: 1.9% of 4 months' consumption in winter season; exporter on yearly level

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Structure of Power Generation (without K&M)

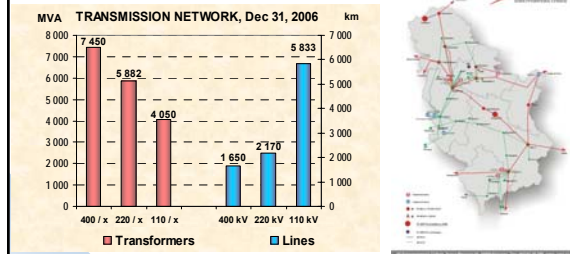
7155 MW (+ 1200 MW at K&M)



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Transmission Infrastructure

www.ems.rs



2007:

Input: 47,884 GWh
Output: 46,597 GWh

Losses rate: 2.69%

Withdrawal from the neighboring systems: 8,905 GWh
Injection into the neighboring systems: 8,658 GWh

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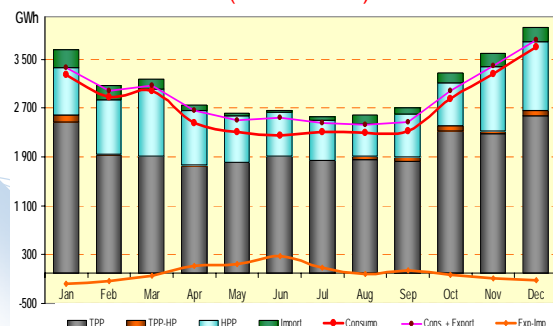
Electricity Balance 2007 (1) (without K&M)

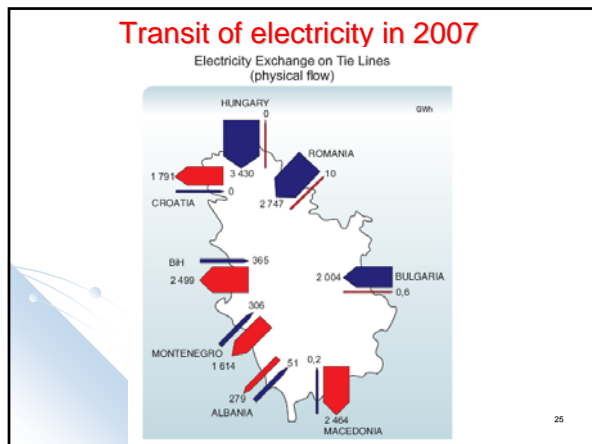
2007:

- Generation: 34.4 TWh
- Gross consumption: 32.9 TWh
- Import: 1.8 TWh
- Export: 1.8 TWh
- Lignite production: 36.5 mill t
- Number of consumers: 3.3 mil

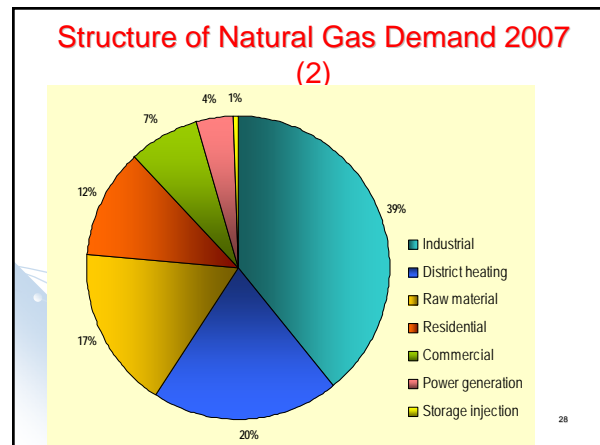
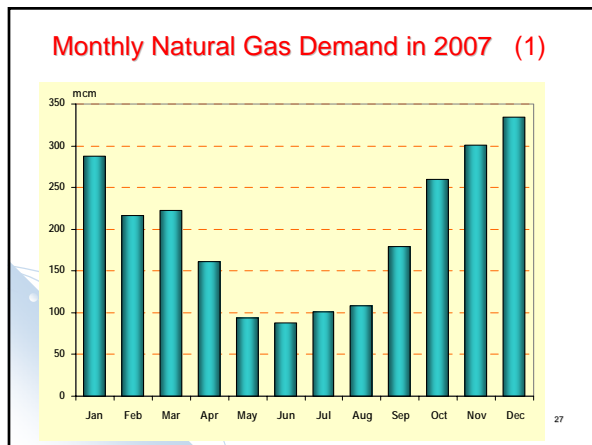
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Electricity Balance 2007 (1) (without K&M)





- ### Natural gas – basic infrastructure
- One input point – from Hungary
 - Operating pressure in input point 43 bar
 - Natural gas storage - Installed capacity:
 - I phase 400 mcm
 - II phase 800 mcm
 - Transmission lines, total length 2200 km
 - Compressor station near Belgrade 4400 kW
 - Distribution pipeline - total length 10500km
 - Number of the main regulatory measurement stations - 152
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- ### Development and investment plan
- Legal framework
 - Regional approach and key studies
 - Most important issues
- 29

- ### Development and investment plan - Legal framework -
- Government - for Serbia
 - Energy Law, adopted 2004
 - Energy Strategy until 2015, adopted 2005
 - Program of Strategy implementation, adopted 2005
 - Industry - for itself
 - 5 years Development plan - public utilities obligation
 - Yearly program of investments – obligation for all companies
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Development and Investments - Key studies -

- Regional and national approaches
- Studies:
 - REBIS:GIS – Regional Balkans Infrastructure Study and Generation Investment Study 2005 - 2020
 - List Cost Investment Plan for Serbia
 - South East Europe: Regional Gasification Study with regard to analysis of storage facilities
 - South East Europe: Regional Gasification Study
- Recommendations for electricity sector:
 - SEE region will require
 - 12,700 MW of new capacity
 - 9,400 MW of rehabilitated capacity - to extend life time
 - Serbia will require min
 - 640 MW of new capacities
 - 2,800 MW of rehabilitated capacities - to extend life time (mostly accomplished)

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Development and Investments - Resource (1) -

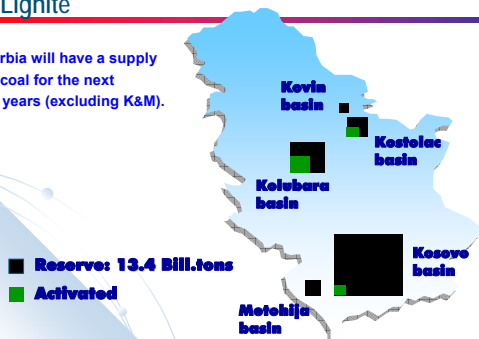
- Domestic resources
 - Lignite
 - Hydro potential
 - Renewable sources
- Imported resource
 - Natural Gas

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Development and Investments - Resource (2) -

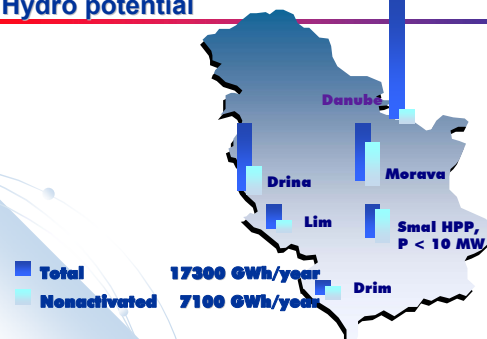
Lignite

Serbia will have a supply of coal for the next 50 years (excluding K&M).



Development and Investments - Resource (3) -

Hydro potential



Development and Investments - Resource (4) -

Renewable sources - Potential Assessment

- Small Hydro PP
 - 850 Sites, 450 MW, 1 500 GWh/year
 - CADASTRE of Small PP's ('87)
- Biomass
- Wind power plants - farms
- Waste incineration...

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Development and Investments - Electricity until 2015 - (1)

- Electricity demand forecast: 0.9% annually, by Electric Power Industry of Serbia, Development plan 2008 – 2015
- Investment plan, rehabilitation and modernization of existing and construction of new capacities – 9.5 billions €
 - HPP – 1 056 millions €
 - TPP and environmental protection – 3 840 millions €
 - Open-pit mines – 2 095 millions €
 - Transmission system – 400 millions €
 - Distribution system – 746 millions €
 - Other – 1323 millions €

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Development and Investments - Electricity until 2015 - (2)

- The most important rehabilitation projects:
 - HPP Đerdap, 6x176 MW, 113 millions €
 - HPP Bajina Bašta, 4x91 MW, 56 millions €
- Reconstruction and upgrading
 - CHP Novi Sad, 208 MW, 750 millions €
- New TPP capacities in the near future:
 - TPP Kolubara B, 700 MW (2x350 MW) lignite fired power plant, 750 millions €
 - TPP Nikola Tesla B3, 700 MW lignite fired supercritical power plant, 900 millions €

with adequate capacity in Open-pit mines

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Regulator AERS responsibilities regarding development issues

Element which impacts on development	Responsible
Security of supply	Ministry
Energy Strategy	Parliament
Program of Strategy Implementation	Government
Energy balance	Government
Market opening and development	AERS
Privilege producers and Renewable sources	Ministry
Development plan of PU (for 5 years)	Government
Yearly program of investment	AERS' opinion
Energy price methodology for regulated activities	AERS
Price level	Decision of Government based of AERS' opinion

Final remarks / Conclusion

- The most important issues
- Improving of AERS' role

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The most important issues regarding energy sector development

- Electricity
 - Possibilities of participation in investment in TPP capacities based on coal at K&M
 - To reach an economic electricity price
 - Speed of district heating systems development
 - Usage of electricity for heating
 - Effects of energy efficiency and rationalisation measures
<http://www.seea.sr.gov.yu>
 - Incentives for private capital investments
 - Strategy partners
- Natural gas
 - Heavy dependence on imports and poor interconnections
 - Uncertain price of Russian gas
 - Russian-Serbian governments agreement

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Improving of AERS' role

- The AERS's role is defined by Energy Law
- Participation in rules improvement:
 - Energy Law
 - Secondary legislation
 - Privileged producers – renewable energy sources act

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ENERGY AGENCY OF THE REPUBLIC OF SERBIA

Thank you for your attention!

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