

# Energy Sector in the Balkans Energy-Economy Outlook

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**PRIMES MODEL  
E<sub>3</sub>MLAB – NTUA  
PROF. P. CAPROS**

**JUNE 2009**

# Macro-economic projections

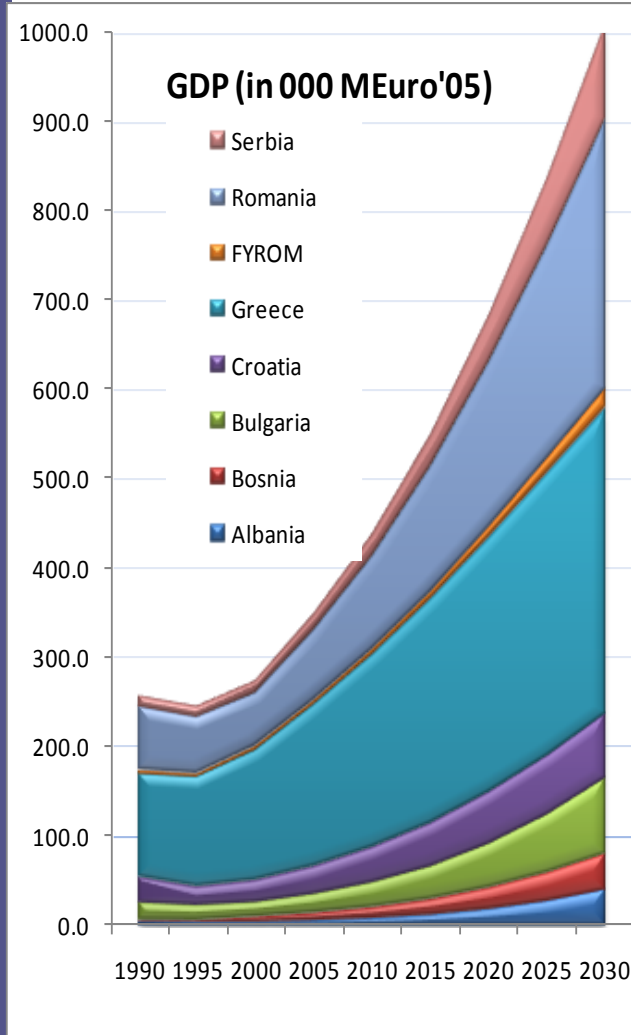
Scenario for the European Commission before the Crisis

Sustained growth of Balkans: 4-5% per year

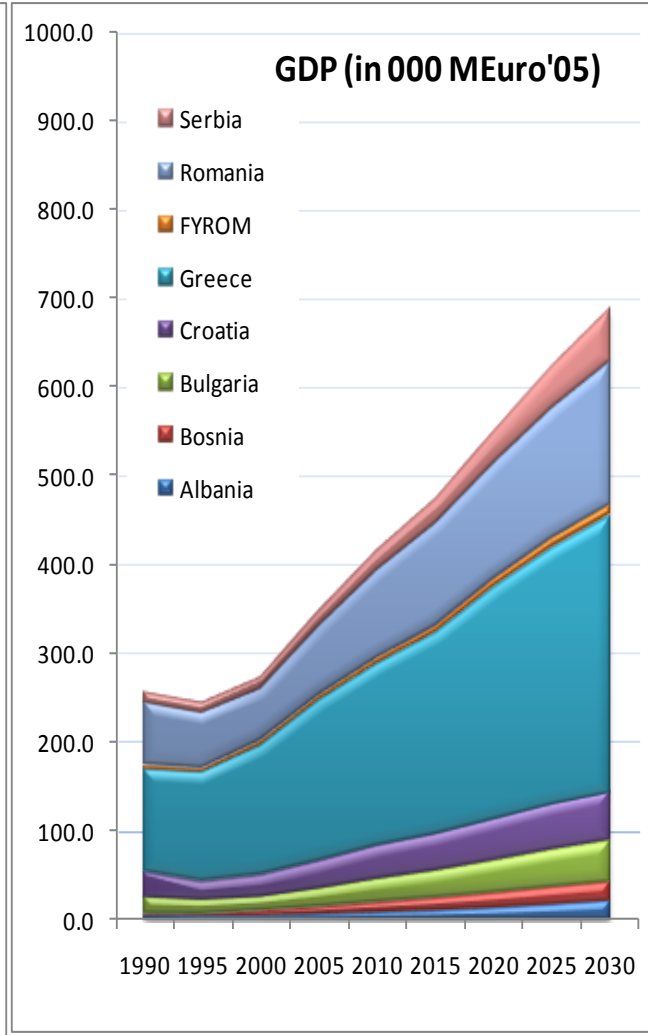
Scenario post Crisis, taking into account new projections by ECFIN

Lower growth of the Balkans: recession 2009-2010, then growth less than 3% per year

## View 2 years ago



## Current View



## Implications

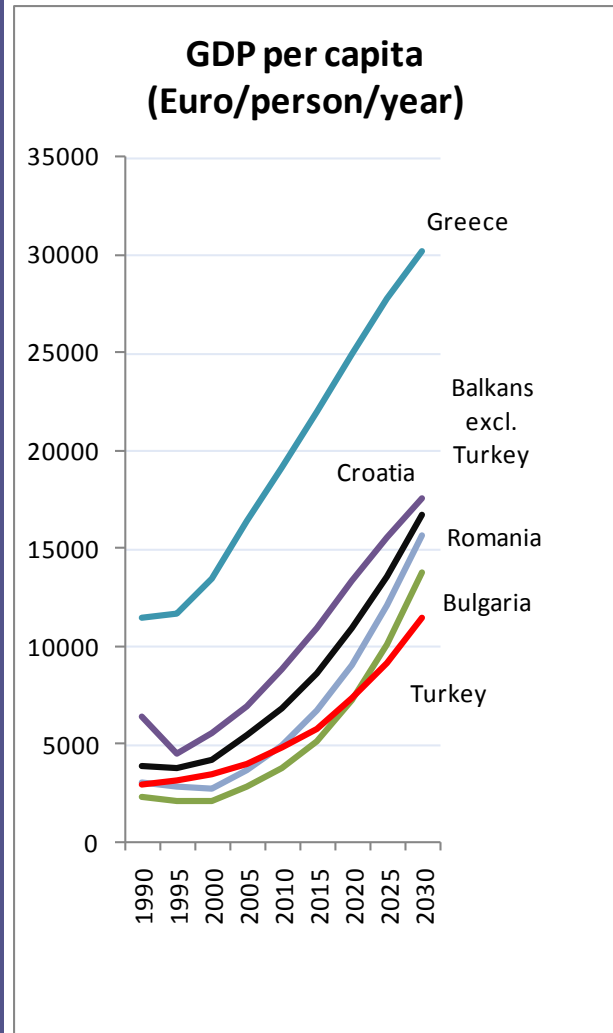
Significantly less real income per capita, than expected two years ago

Downwards revised prospects for investment and energy intensive industry

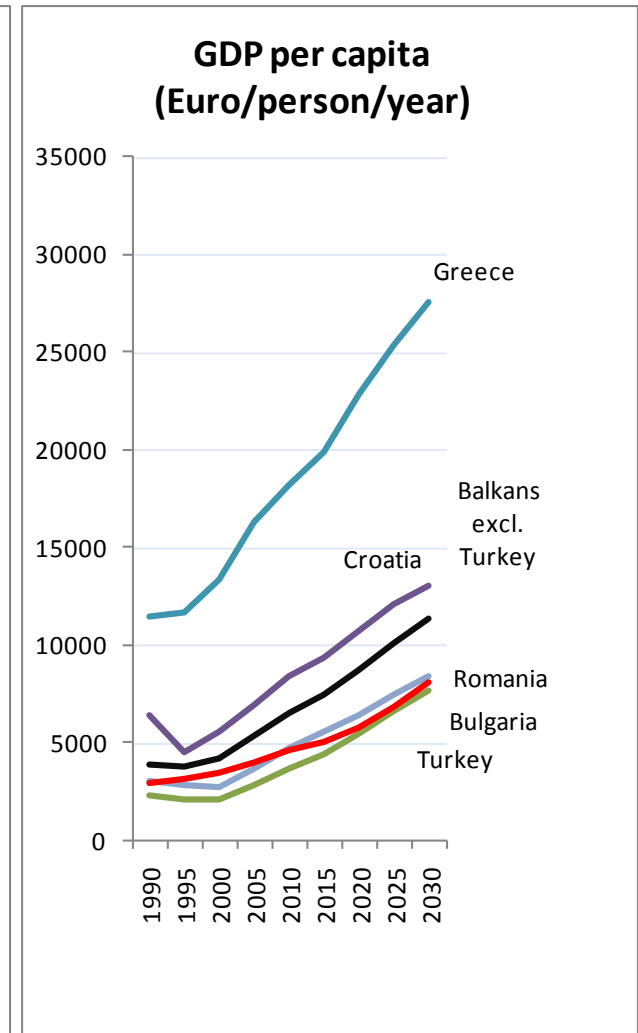
Lower growth of transport activity

Hence less energy consumption

### View 2 years ago

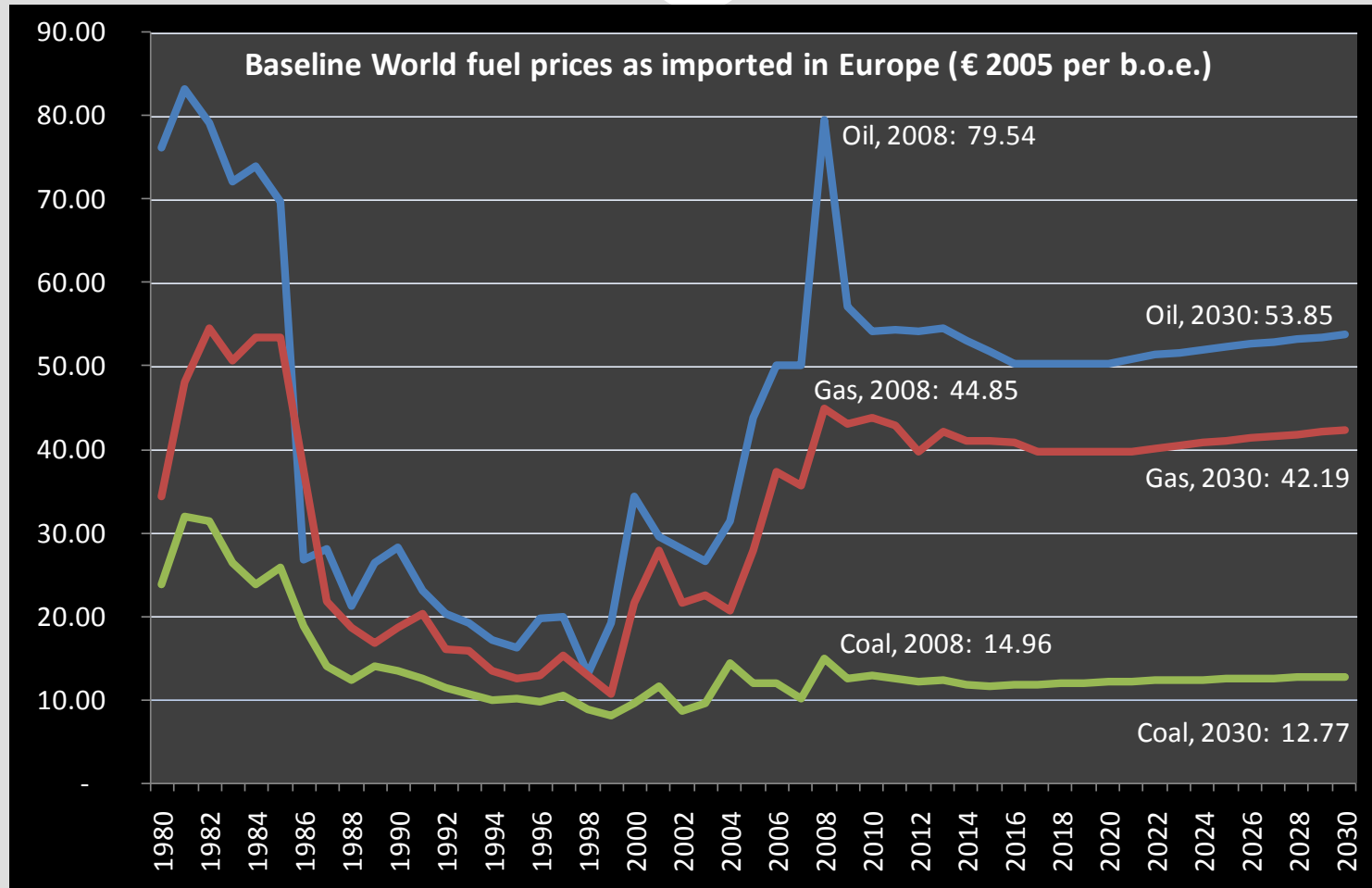


### Current View



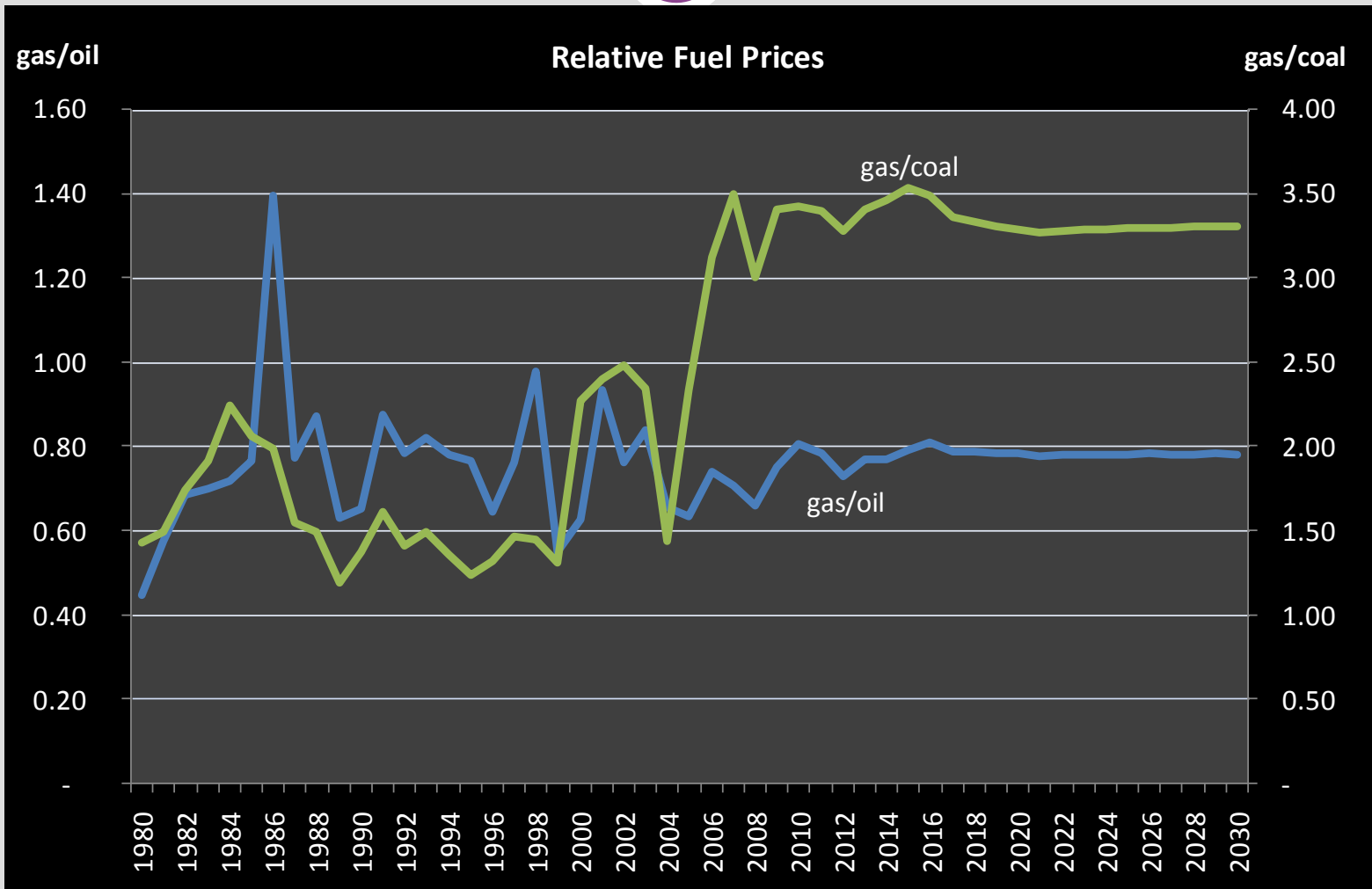
# World Fuel Prices

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# Gas to Coal Competitiveness deteriorates

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# Policy Assumptions

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- The Balkan countries gradually adopt the “*acquis Communautaire*” but the non EU MS at a much slower pace
- **The Internal Energy Market, mainly cross border trade, is assumed to develop, but large-scale trade among countries fails to develop**
- Security of supply constraints continue to apply on a national scale
- **Large combustion plant directive applies on new constructions**
- Energy efficiency standards (buildings, cars, etc.) are gradually implemented in the long term, leading to energy savings
- **EU ETS applies only on EU MS but with moderate carbon prices (20 -25 Euros per ton of CO<sub>2</sub>)**
- RES obligation not mandatory but support policies increase mainly for wind, biomass-waste and for some hydro and PV
- **Nuclear is assumed to develop only in Bulgaria, Romania and Turkey**

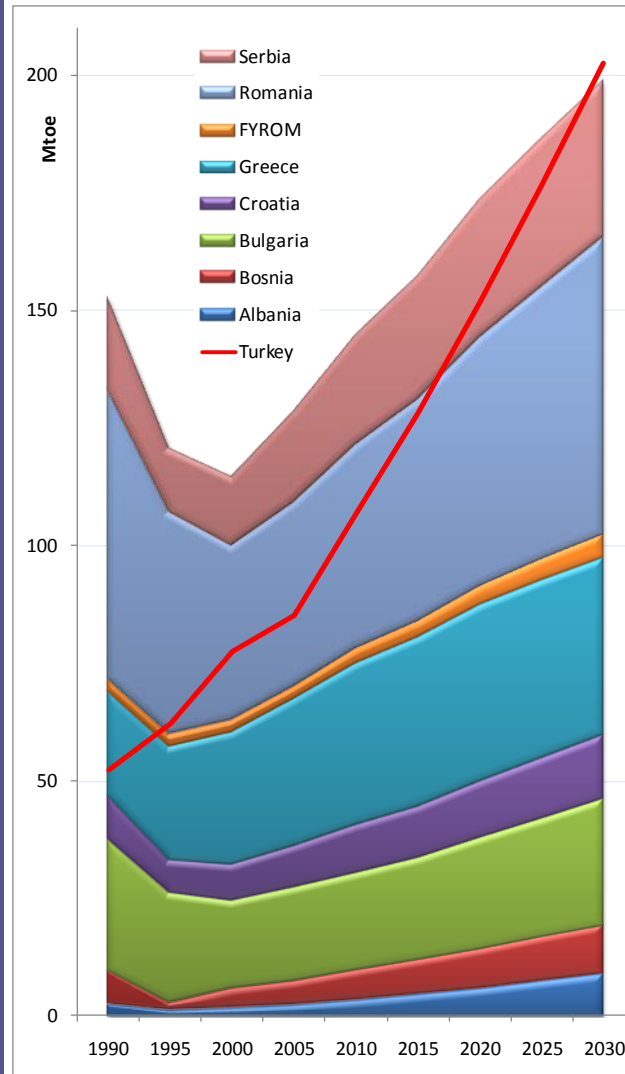
## Total Primary Energy Consumption

Instead of roughly 2% increase per year believed two years ago, lower economic growth induces total primary energy consumption growing on average at 0.2% per year in the period 2005-2030

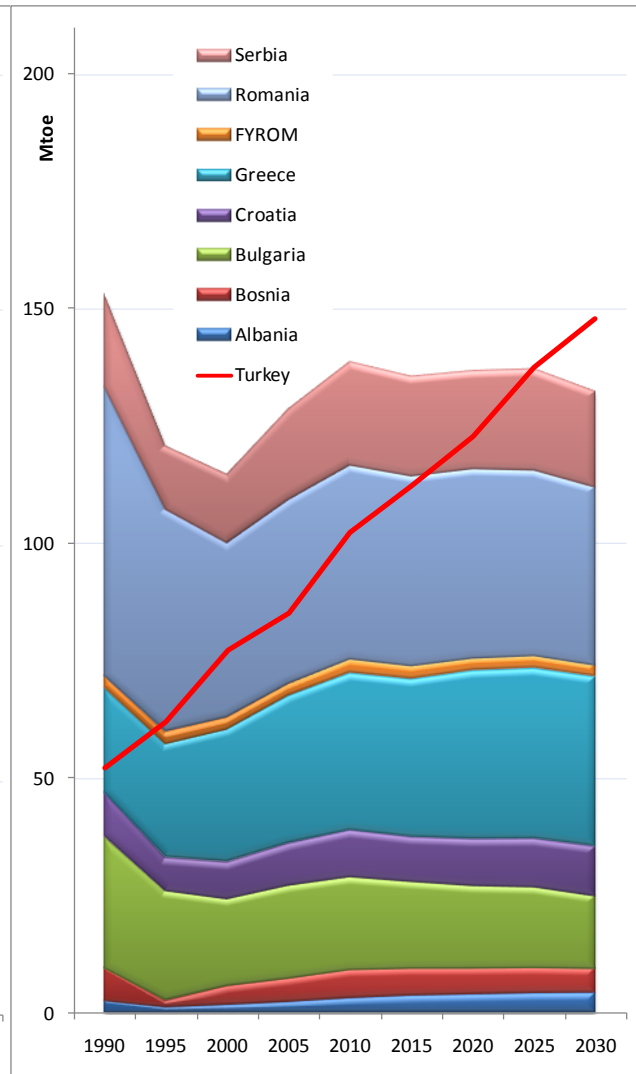
Turkey's energy needs become as large as the sum of rest of countries

Romania has the largest share, beside Turkey, followed by Greece and Bulgaria

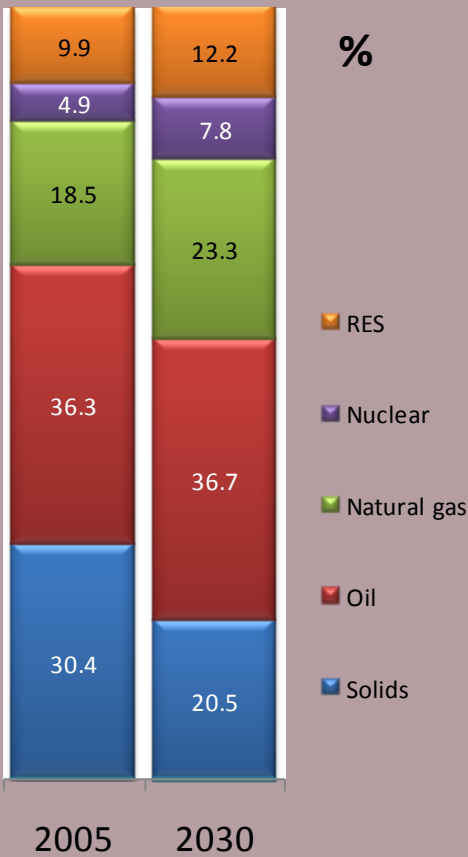
### View 2 years ago



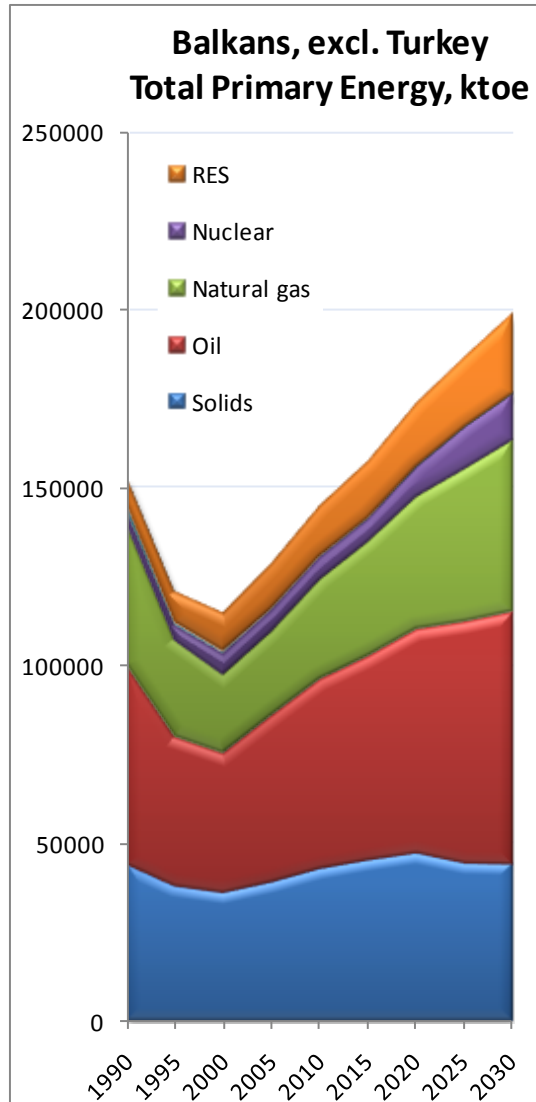
### Current View



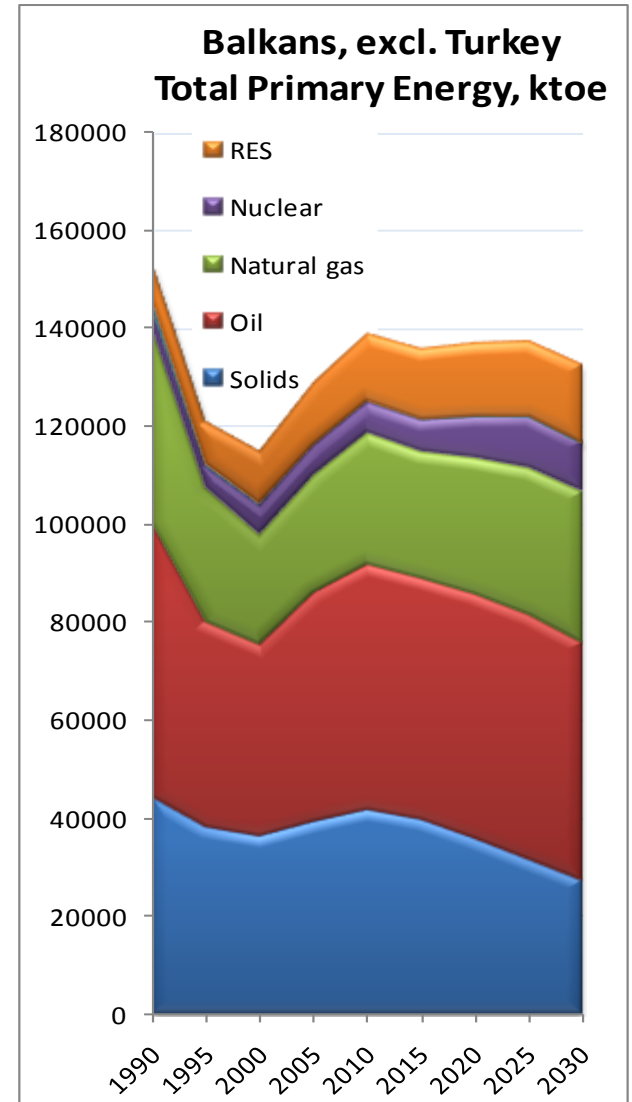
# Structure of Primary Energy Consumption



View 2 years ago



Current View



## Fossil Fuel Needs

Fossil fuel requirements are half of what they have been expected two years ago

However, fossil fuel needs by 2020 and 2030, compared to 2005, are substantial

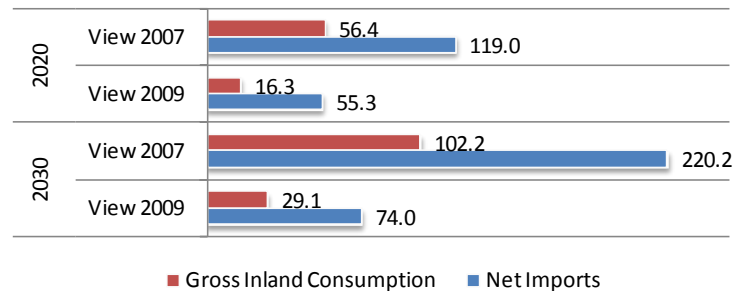
Gasification in the Balkans is a dominant trend, but gas volumes are lower than expected

Oil use persists mainly in transportation

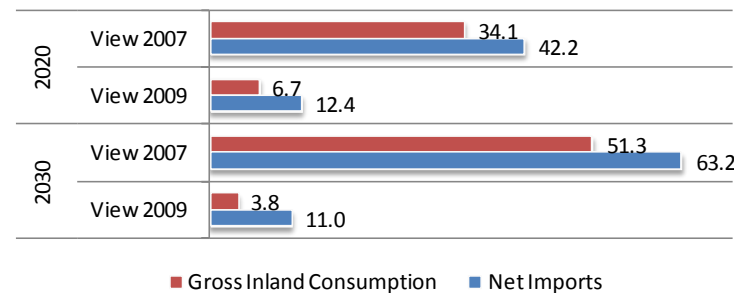
Coal imports emerge

Balkans  
excl. Turkey

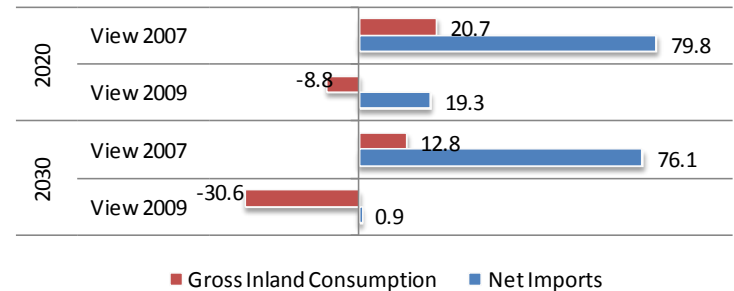
Gas: % change from 2005



Oil: % change from 2005



Coal: % change from 2005

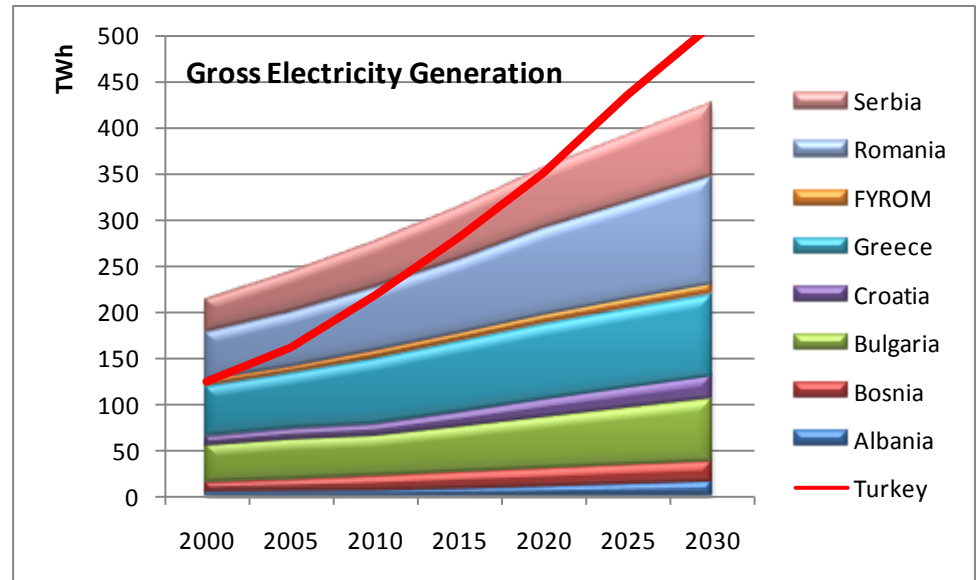


# Electricity Sector

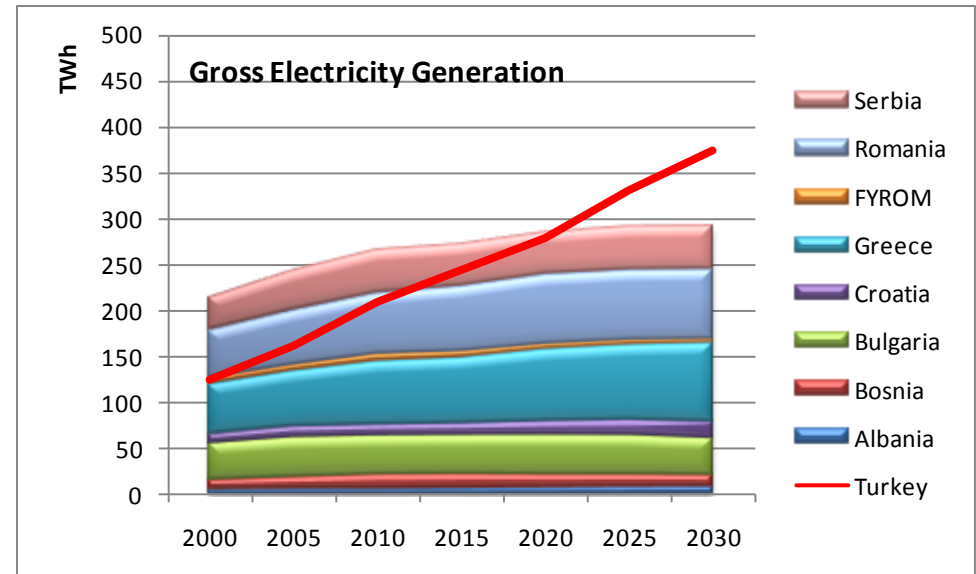
Electricity demand growth displays significant slowdown as a result of lower economic growth

Instead of 2.3% annual increase (2005-2030) projected before the crisis, the current outlook projects a mere 1% average annual increase in electricity generation (rates for Balkans excl. Turkey)

View  
2 years ago



Current  
View



# Structure of Power Generation

Increased used of gas-based power is observed in both economic growth scenarios (gas gets 20% by 2030, but its capacity s halved in low growth scenario)

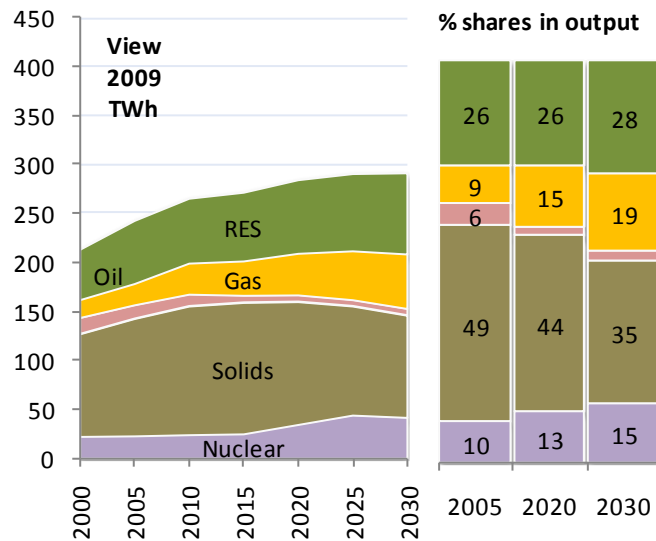
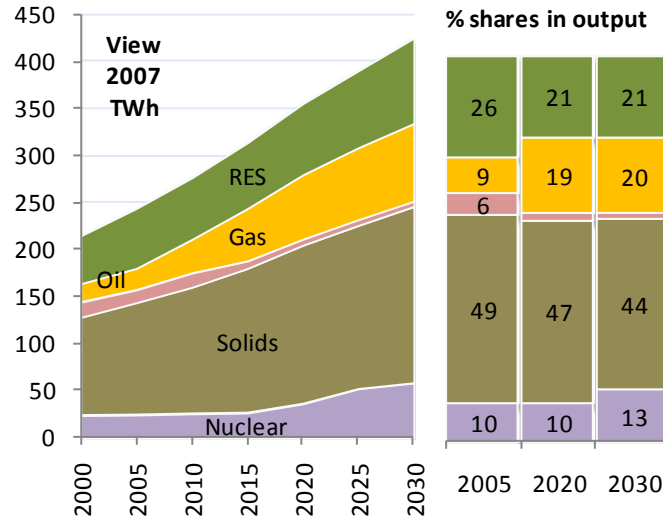
Share of Solids in Power reduce over time

Lower economic growth induces 8 GW less capacity in 2020 and 26 GW less in 2030

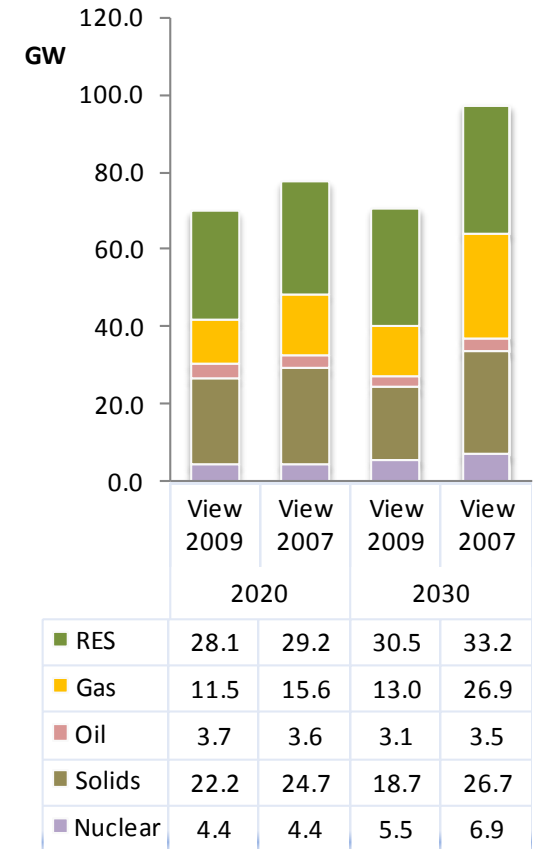
Renewables increase and develop impressively in both scenarios

1 GW nuclear not built under the low growth scenario

## Generation



## Capacity



# Net Imports of Electricity

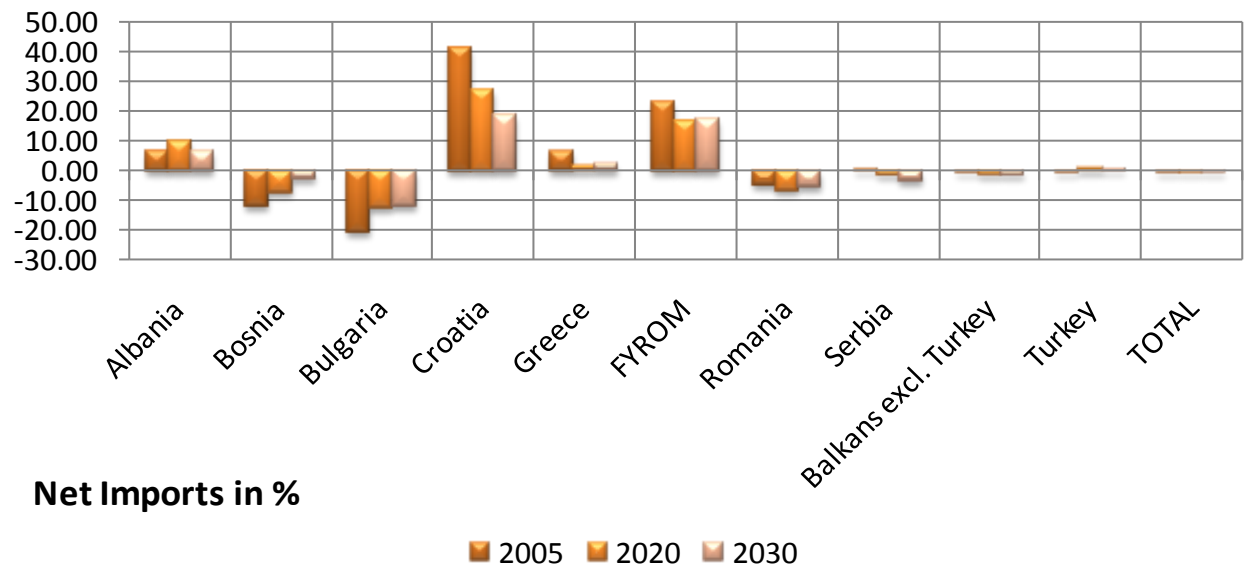
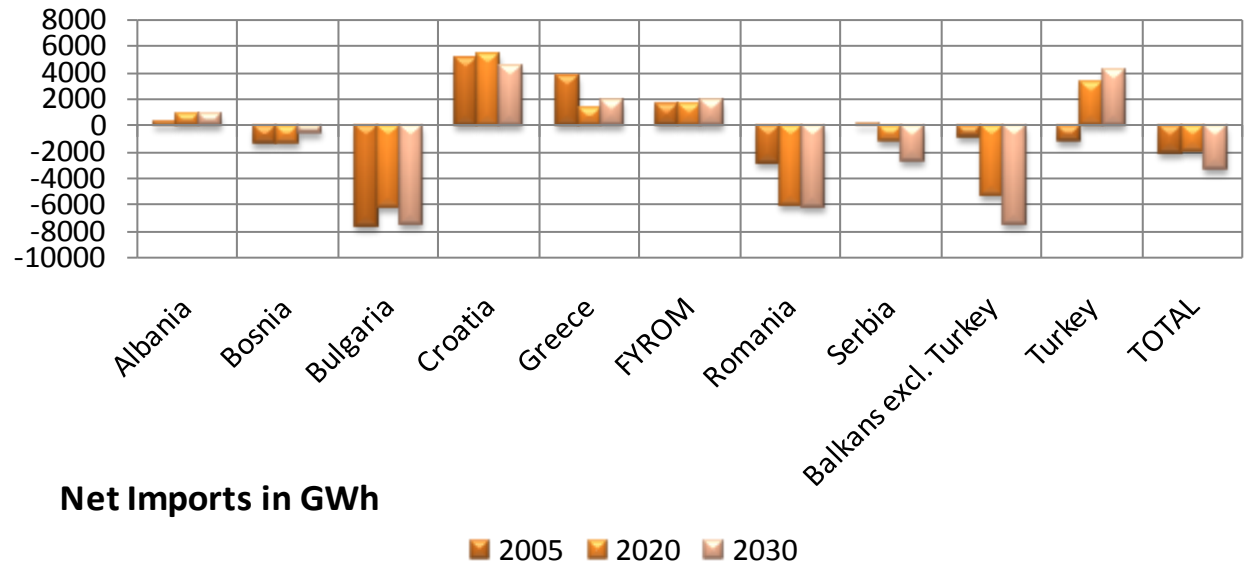
Bulgaria and Romania are the main exporters

Croatia, FYROM and Albania rely on Imports

Percentage of electricity covered by trade generally reduce over time

Turkey is rather balanced

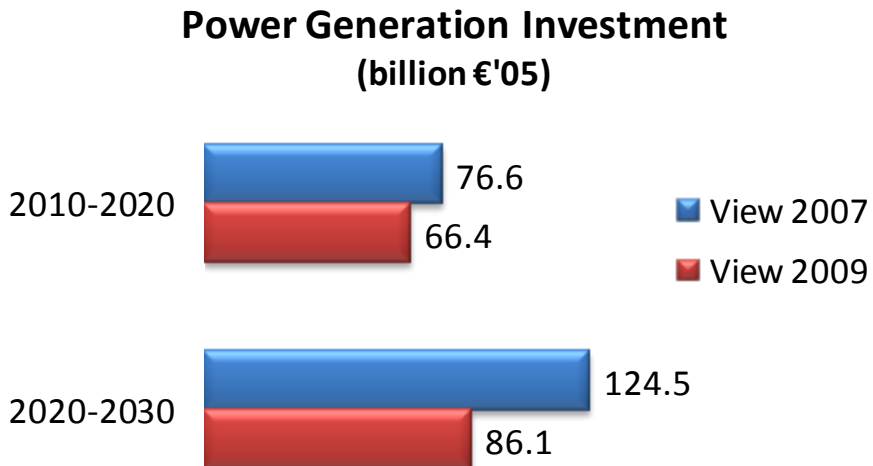
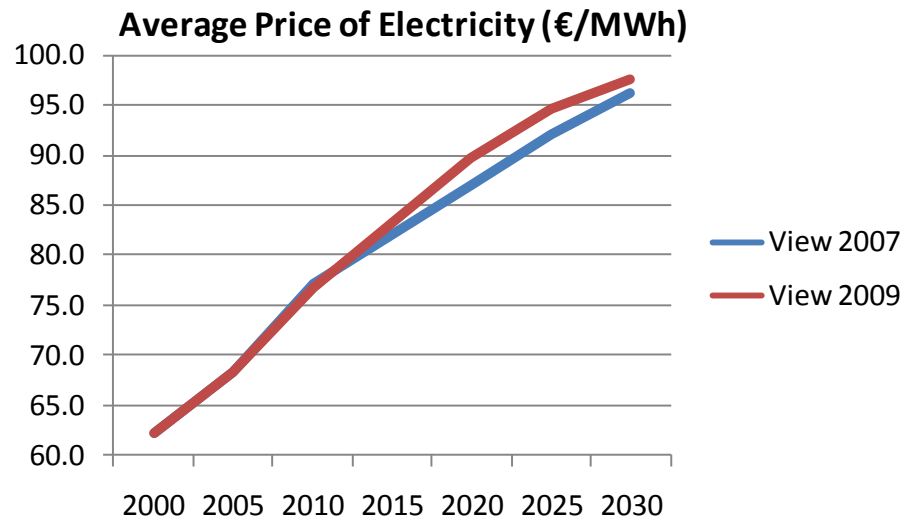
Balkans excl. Turkey are net exporters



## Prices and costs of Power

Electricity prices are found to increase steadily (roughly at 1.5% per year above inflation)

Due to lower economic growth prospects, power generation investment reduces by 13% between 2010-2020 and by 30% between 2020-2030, compared to high economic growth expected two years ago



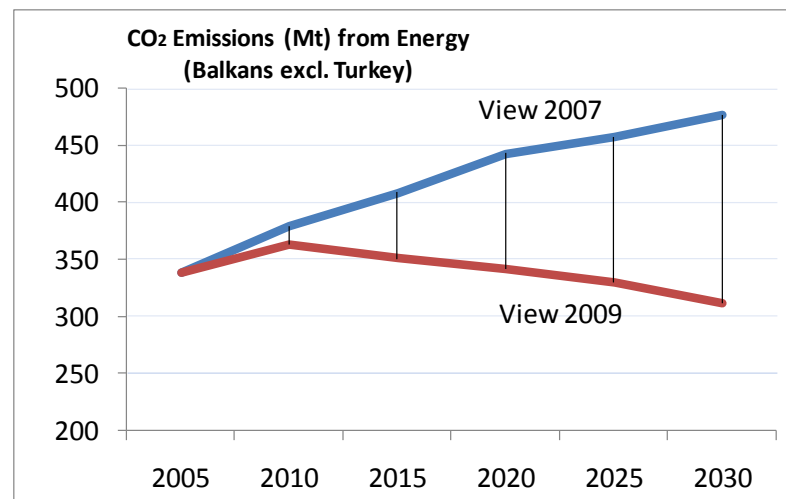
## Sustainability Indicators

CO<sub>2</sub> emissions from energy in the Balkans excl. Turkey decrease from 2005 in the post-Crisis scenario

Emissions in Turkey slowdown but still increase form 2005

RES as % of Gross Final Energy Consumption increase in the post-Crisis scenario compared to the View of 2007

CO <sub>2</sub> Emissions from energy (Mt)	View 2009			View 2007	
	2005	2020	2030	2020	2030
Albania	4.6	8.2	9.4	13.3	21.7
Bosnia	16.0	16.8	14.6	26.1	30.6
Bulgaria	45.1	34.3	22.2	52.3	52.2
Croatia	19.9	21.9	23.5	27.2	30.8
Greece	96.2	102.0	99.0	107.3	104.2
FYROM	8.2	7.8	6.8	11.9	14.2
Romania	89.7	91.6	79.0	119.7	130.5
Serbia	58.7	59.1	56.9	85.3	93.0
Turkey	218.2	331.1	384.4	406.9	534.9
<b>Total</b>	<b>556.6</b>	<b>672.6</b>	<b>695.8</b>	<b>850.0</b>	<b>1012.1</b>
<b>Index (2005=100)</b>	<b>100</b>	<b>120.8</b>	<b>125.0</b>	<b>152.7</b>	<b>181.8</b>
<b>Total excl. Turkey</b>	<b>338.4</b>	<b>341.6</b>	<b>311.4</b>	<b>443.2</b>	<b>477.2</b>
<b>Index (2005=100)</b>	<b>100</b>	<b>100.9</b>	<b>92.0</b>	<b>130.9</b>	<b>141.0</b>



# What if Climate Action and RES Policy applies?

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- The economic context is assumed as in the post-Crisis scenario (economic growth roughly 2% pa)
- ETS applies on all Balkan countries as for the EU
  - Auctioning for power generation, beyond 2020
  - Allowances progressively reduced (-21% in 2020 from 2005 for the whole of Europe)
  - CDM carbon credits partly used in 2020
  - ETS clearing prices: 22 €/t CO<sub>2</sub> by 2020 and 43 €/t CO<sub>2</sub> by 2020
- Non ETS targets applicable only on Greece (-0.4% from 2005)
- RES as % of Gross Final Energy Consumption target (20% by 2020) applies on the whole Europe and trading of Guarantees of Origin is allowed

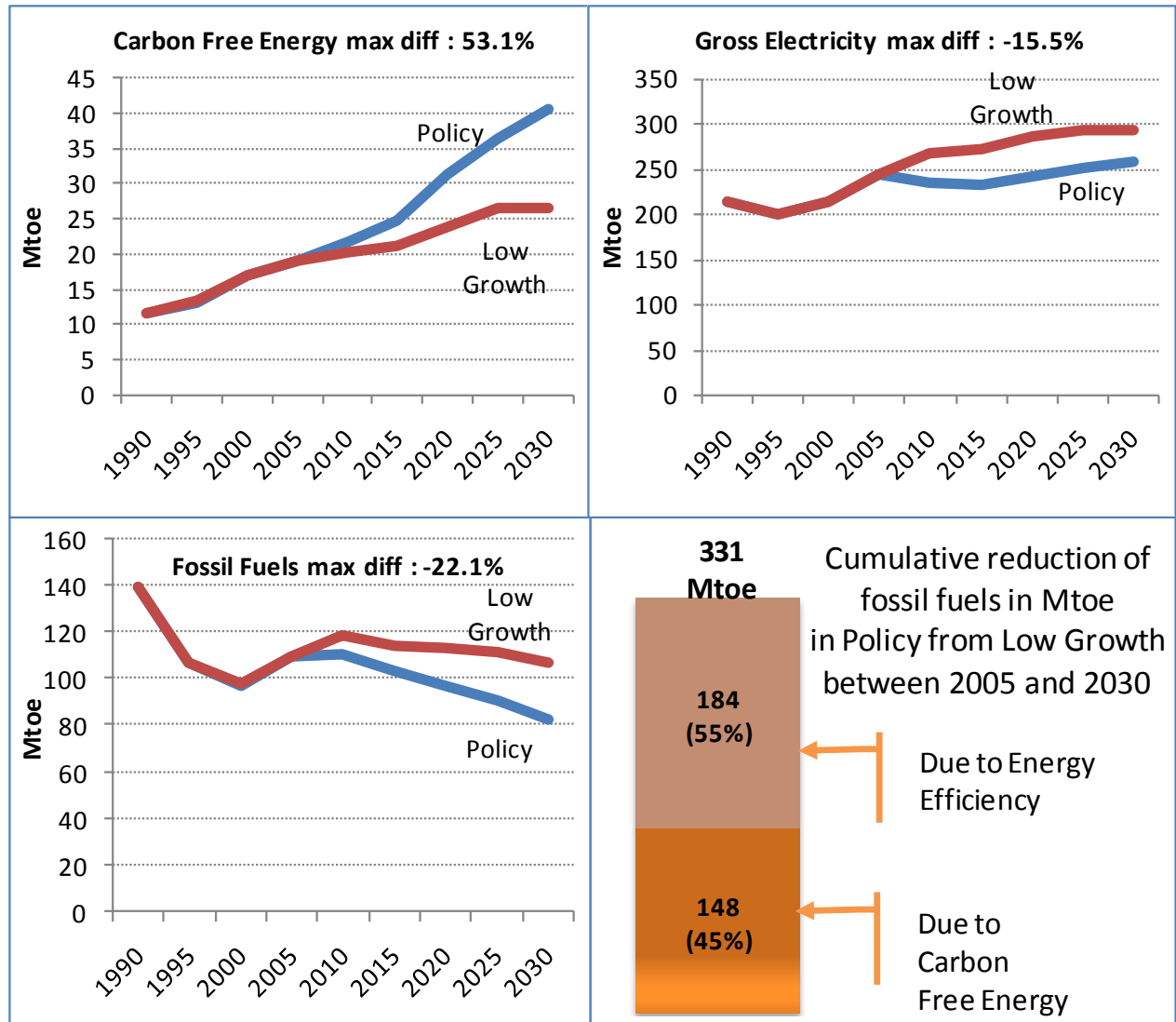
## Climate Action and RES policy

ETS prices combined with RES trading induce significant changes in energy system structure of the Balkans

The changes include considerable increase in carbon free energy and reduction in fossil fuel requirements

Energy efficiency and higher electricity prices (due to auctioning) imply lower demand for electricity

### Balkans excl. Turkey



## Power sector changes

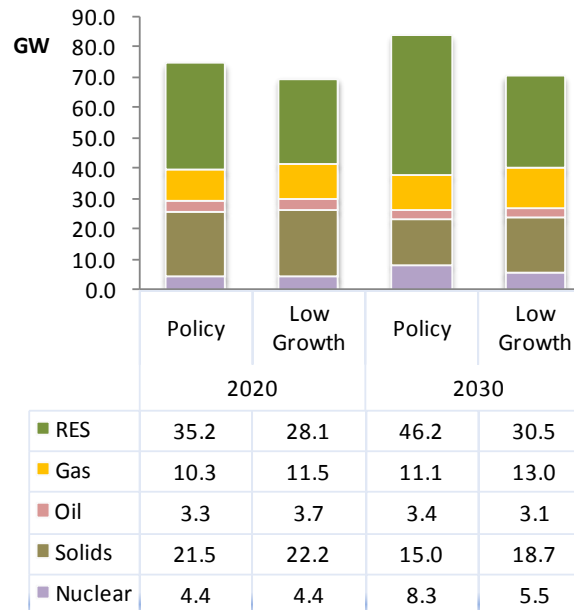
Investment in power generation is affected giving priority to Renewables and Nuclear (2800 MW more are built post 2020)

Use of solid fuels is reduced considerably, as the scenario assumes a rather pessimistic view on CCS

Gas requirements are lower than without the policy, because of RES and higher efficiency

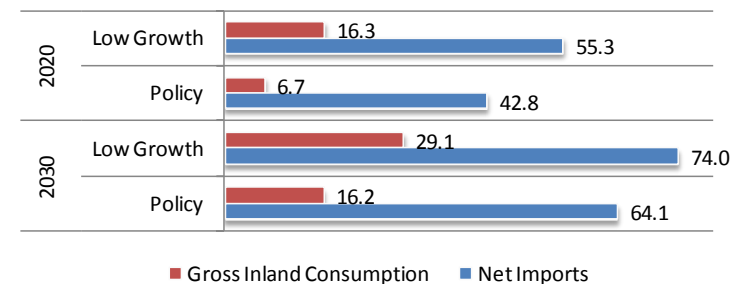
Incremental power from RES is delivered mainly by Wind and Biomass and less by PV

## Balkans excl. Turkey



Policy: Net Power Capacity (GW)					Diff. from Low Growth	
	2005	2015	2020	2030	2020	2030
Total RES	22.7	28.7	35.2	46.2	7.1	15.8
Hydro	21.9	23.6	24.3	24.8	0.5	0.5
Wind	0.6	3.9	6.1	12.3	2.8	8.0
- onshore	0.6	3.9	6.0	11.4	2.7	7.1
- offshore	0.0	0.0	0.1	0.9	0.1	0.9
Solar	0.0	0.4	2.4	4.5	1.6	3.3
Geothermal, etc.	0.0	0.0	0.0	0.1	0.0	0.0
Biomass	0.2	0.7	2.4	4.5	2.1	3.9

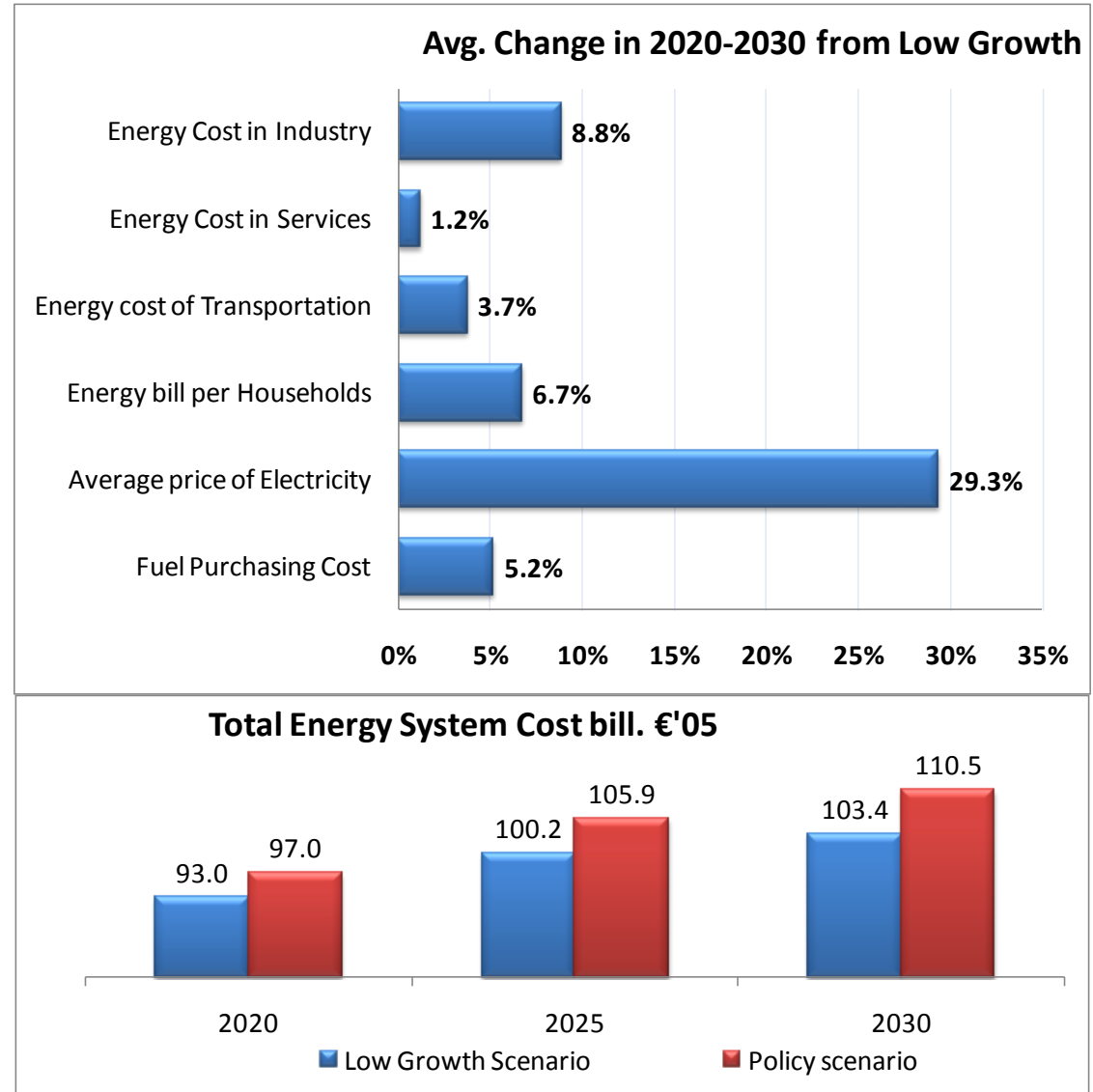
### Gas: % change from 2005



## Costs and Prices

Electricity prices are affected because of higher costs for restructuring and the auctioning of ETS allowances

Total energy system costs are between 5 and 8 billion Euros of 2005 per year from 2020 onwards. This includes costs for consumers to purchase energy and to invest in energy efficiency.



# Conclusions

- Economic growth scenarios for the Balkans after the financial crisis are pessimistic
- They imply considerably lower prospects for future energy demand, investment and fossil fuel needs, compared to projections two years ago
- Gasification trends and development of renewables is a dominant trend; however future gas needs are found lower than expected in the recent past
- Applying the EU Climate Action and RES policy package on the Balkans induces significant changes: energy savings, impressively more RES (wind and biomass) and more nuclear. Gas needs reduce slightly. However, such a policy implies higher electricity prices but a modest increase in overall energy system costs
- Clearly, much uncertainty surrounds energy system prospects for the Balkans, regarding investment, import requirements and the fuel mix

# Thank you

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