

Energy Efficiency and RES: a way to combat climate change

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for Central and Eastern Europe

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Outline

- GHG emission from energy sector
- Energy Efficiency and RES: their place in the combat with climate change
- EE and RES: role in the political process
- Climate Change and its impact on RES and EE
- Brief summary

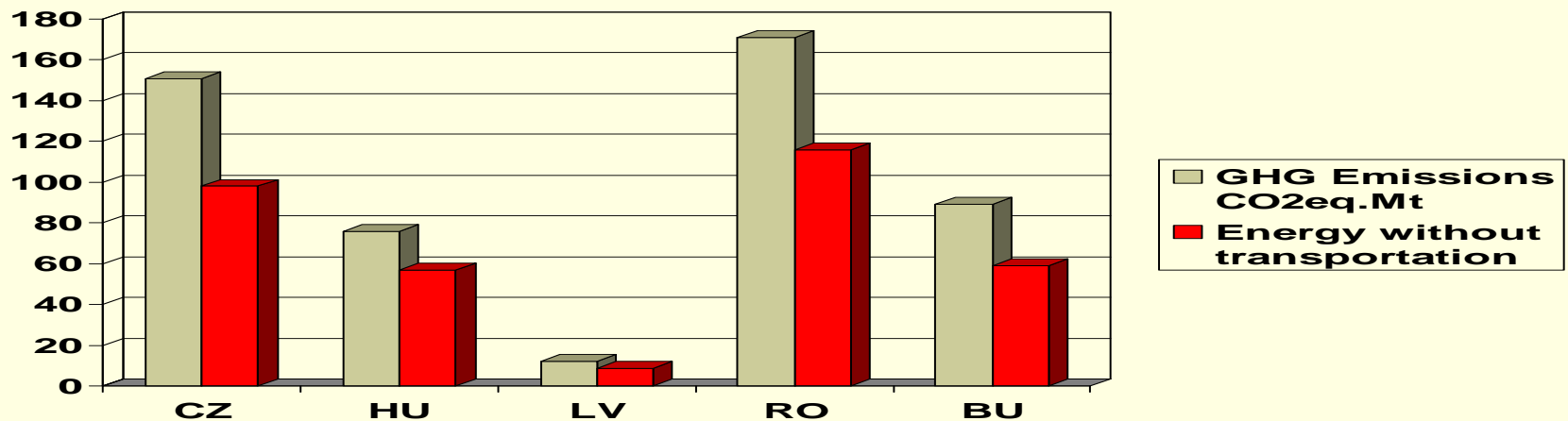


Climate Change side of the story

- Main Enemy: Greenhouse Gases (anthropogenic origin)
- RES and EE projects – alliances in the struggle to reduce notorious GHG emissions
- In this region – main alliances

GHG emissions from Energy Sector in GHG emission balance in 2007

(in the CEE and SEE region the share of GHG emissions from energy sector 49-65%)



Source: National Communications of countries for UNFCCC



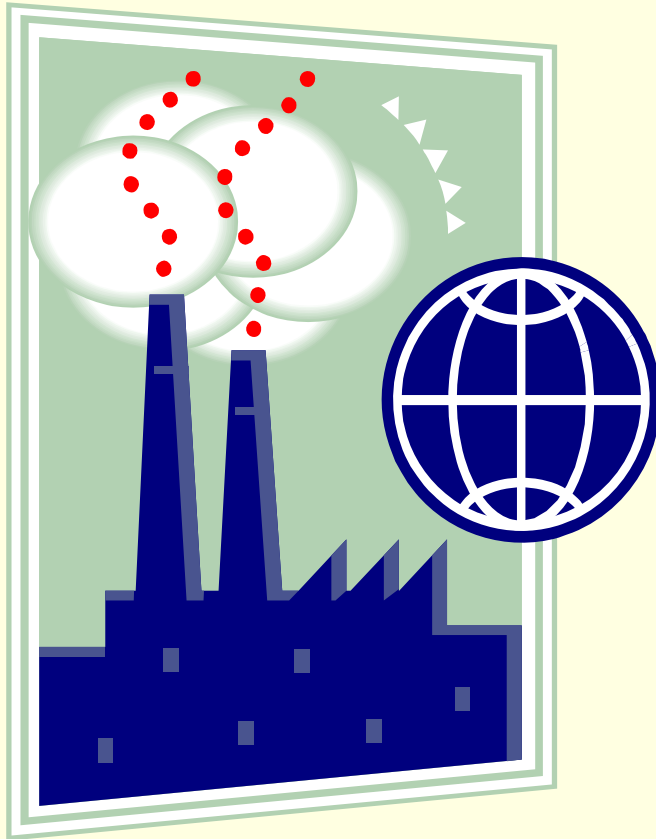
CO2 intensity per unit of GDP (2004)

Country	Tons CO₂/USD 1000
Denmark	348
Austria	351
Japan	498
EU	522
Germany	548
UK	573
USA	641
Greece	1011
FYR Macedonia	2412
Albania	2888



EE and RES: saving climate at the source

(GHG emissions reductions through decreased demand for fossil fuels)



PRODUCTION SIDE STORY

- More efficient boilers, engines, turbines for electricity and heat production
- More energy efficient transmission of energy
- Fuel switch (oil or coal to natural gas to carbon neutral fuel)
- Carbon efficient BATs in industries



RES and EE: Saving climate together with end-user: reducing GHG emissions through decreased energy consumption

CONSUMPTION SIDE STORY

- Insulation of buildings

! Way do adapt for the consequences of climate change

- More energy efficient home gadgets (labeling)
- Installing regulatory and monitoring equipment
- Replacing electric bulbs for LED
- Thinking **before** opening the fridge what we need there **NOT after** it is open



Recognized importance of EE and RES measures to combat climate change in the political process

- Copenhagen Accord:
 - submitted pledges from non-Annex I countries
 - Brazil
 - China
 - India
 - South Korea
 - Targets from Annex I countries do not specify exactly how they should be completed



- **UNFCCC process:**

5 National Communications (submitted in by January 2010), chapter 4: National Policies and Measures

- **EU process:**

- “20-20-20” goal in the “Climate and Energy Pack”
- Among 36 Common Coordinated Policies and Measures (CCPM) – 14 are on energy efficiency and use of renewable energy



Climate Change and financial mechanisms for EE and RES

- Project Based Flexible Mechanisms under the Kyoto Protocol (Hope: they survive the first commitment period 2009-2012):
 - Joint Implementation (Art. 6)
 - CDM (Art. 12)
 - JI and CDM and EU ETS through Linking Directive
- Mechanisms beyond Kyoto Protocol scope:
 - Green Investment Scheme: proceeds from selling a part of Kyoto quota channeled to EE and RES projects (Hungary, Latvia, Ukraine)
 - Voluntary Carbon Markets: EE – Gold Standard



Climate Change strikes back (well known effects of climate change)

- Increasing temperature (global average, national, seasonal, minimum, etc)
- Decreasing precipitation (average) and changed patterns of precipitation
- Sea level rise



In terms of impacts (sources of RES mostly affected)

- Higher frequency of floods (biomass plantation, infrastructure)
- Higher frequency of droughts (hydroenergy, biomass plantations)
- Decreased rivers run-offs (hydroenergy)
- Migration from South diseases and microorganisms against which the authentic species do not have resilience (quality of biomass)
- Forrest fires
- Sea level rise, coastal erosion, higher frequency of storms and gales (infrastructure, wind turbines)





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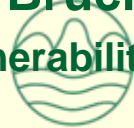


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Research and study for the project: “Enhance regional SEE cooperation in the field of climate policy”

**Impacts of climate change to the
power sector and adaptation response measures in the Mati River
catchment's area**

Ms. Ermira Fida, Project Manager, CCU/P, MEFW
Mr. Besim Islami, PhD; Energy Planning Engineer
Team Leader of the GHG Inventory and Abatement
Ms. Eglantina Demiraj Bruci, Prof. Dr; Physicist
Team Leader on Vulnerability and Adaptation



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Methodology

- selection of the **Mati River Catchment (MRCA)** area as a priority - is derived from the development of the **Alternative scenario for Albanian power sector** (from demand view point).
- The **current trends** of temperature, precipitation and runoff are identified by calculating the seasonal and yearly anomalies from the long-term averages (1961-1990)
- **Climate change scenarios** - **MAGICC/SCENGEN** (version 4.1) different SRES **A1BAIM, A2ASF, B1IMA, B2MES** (TAR, IPCC).
GCMs: **CSM_98, ECH395, ECH498, GFDL90, HAD295, HAD300**



• To evaluate the effects of likely changes of climate on runoff, a hydrological rainfall - runoff model was

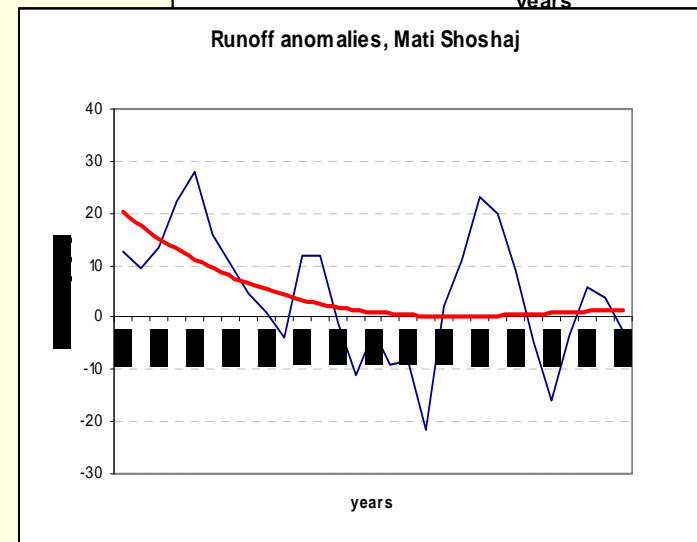
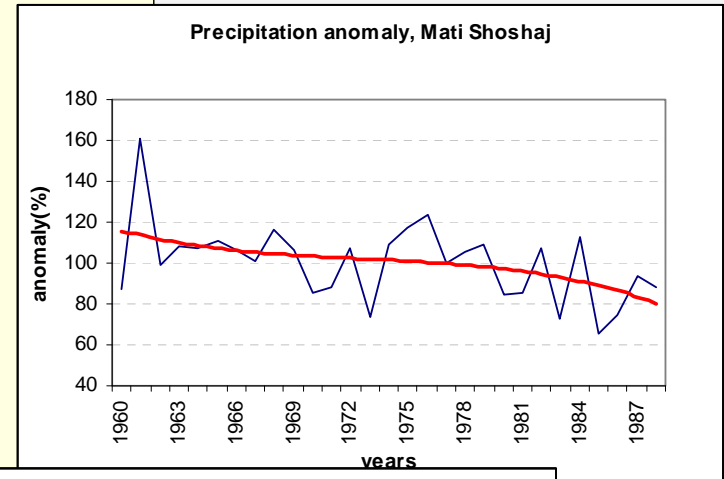
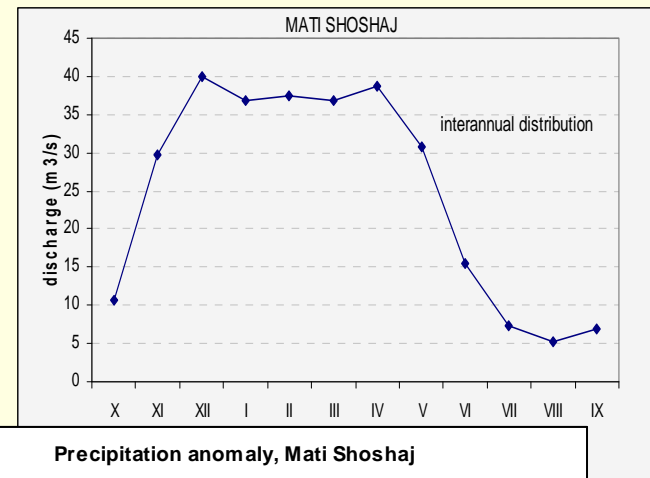
Climate impact on water resources

The water flow - seasonal and monthly variation.

regime : two phases -
November to May contribute for the wet phase and July-September belong to the dry phase

maximum discharge : at the end of the fall and during the winter season, but sometimes even during the others season.

Both profiles show slight decreasing trends in the last years.



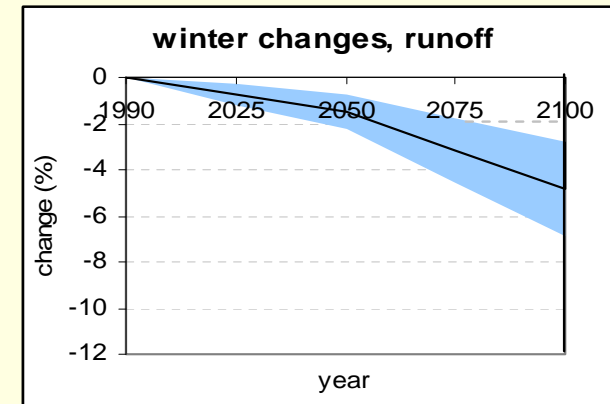
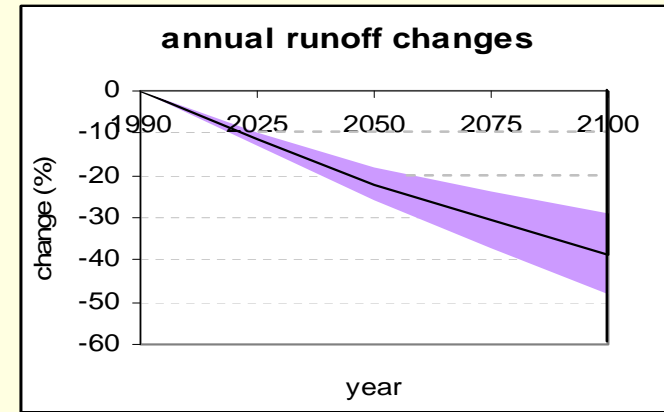
Expected climate changes

- Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level (IPCC, 2007).
- The world's average surface temperature has increased by around 0.74°C over the past 100 years (1906 - 2005). This figure is higher than the 2001 report's 100-year estimate of 0.6°C due to the recent series of extremely warm years, with 11 of the last 12 years ranking among the 12 warmest years since modern records began around 1850.
- A warming of about 0.2°C is projected for each of the next two decades (IPCC, 2007).



Some likely impacts

- Decrease in runoff, both annual and seasonal
- Because of the reduction of stream flows in the wetlands, western part of Albania would experience both increasing demands for water and reduced supply of water, which would decrease wetland area.
- A decrease of 20% in runoff \Rightarrow a reduction of 60% in power generation



Brief Summary

- Fossil fuel burning for energy generating purposes – main contributor of the anthropogenic GHG emissions in Europe
- Projects on EE and RES can contribute significantly towards the decoupling of GDP growth and GHG emissions
- Energy efficiency and RES' importance is recognized in a number of political process
- RES availability is especially sensible to the effects of climate change
- It is important for RES and EE project developers to be a part of the adaptation strategy process on regional and national level

